

TITLE 92 - NEBRASKA DEPARTMENT OF EDUCATION  
 CHAPTER 93 - MINIMUM EQUIPMENT STANDARDS FOR  
 STUDENT TRANSPORTATION VEHICLES

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001 General Information

001.01 Statutory Authority. This chapter is adopted pursuant to Section 79-318(13) of the Revised Statutes of Nebraska (R.R.S.)

"The State Board of Education shall: . . . (13) with the advice of the Department of Motor Vehicles, adopt and promulgate rules and regulations containing reasonable standards, not inconsistent with existing statutes, governing: (a) the general design, equipment, color, operation, and maintenance of any vehicle with the manufacturer's rated seating capacity of eleven or more passengers, used for the transportation of school children; and (b) the equipment, operation and maintenance of any vehicle with a capacity of ten or less passengers, used for the transportation of school children, when such vehicles are either owned or operated, or owned and operated by any school district or privately owned or operated under contract with any school district in this state. Similar rules and regulations shall be adopted and promulgated for operators of such vehicles as provided in 79-607."

And pursuant to Section 79-602 of the Revised Statues of Nebraska (R.R.S.) which states, in part:

"All school boards, the governing authority of any nonpublic school in this state, and all independent contractors who provide student transportation services for such boards of education and governing boards and for military installations shall cause all pupil transportation vehicles used for the transportation of students to be inspected before school opens in the fall and each eighty days during that part of the year when school is in session by a motor vehicle mechanic appointed by the board of education or governing authority having jurisdiction over such students, except that any pupil transportation vehicle that has been inspected under rules and regulations of the Public Service Commission shall be exempted from the provisions of this section. The mechanic shall thoroughly inspect every vehicle used for the transportation of students as to brakes, lights, windshield wipers, window glass, tires, doors, heaters, defrosting equipment, steering gear, exhaust system, and the mechanical condition of every part of such pupil transportation vehicle to ensure compliance with the minimum allowable safety criteria established pursuant to section 79-607 and subdivision (13) of section 79-318. Within five days after such inspection, the mechanic shall make a report of his or her inspection in writing on regular forms provided by the State Department of Education which shall show if the vehicle met the minimum allowable safety criteria for use. Any item not meeting such criteria shall be brought into compliance prior to the vehicle being used to transport students. One copy of the mechanic's report shall be filed with the board of education or governing authority and, if the school contracts with an independent contractor to

provide transportation services, one copy with the independent contractor. The chief administrative officer of each school district shall annually certify, by a written verification statement, to the State Department of Education that the inspection required pursuant to this section have been performed. Such verification statement shall be sent to the department no later than July 31. The chief administrative officer or chairperson of the board of education, the governing authority, or the independent contractor shall, upon request, make available the mechanic's inspection reports for each vehicle used for the transportation of students to the Nebraska State Patrol inspector when the annual school vehicle safety equipment inspections are conducted.

All such boards of education, governing authorities, and independent contractors shall also cause such pupil transportation vehicles used for the transportation of students to be safety inspected at least once during each calendar year by the Nebraska State Patrol or the patrol's carrier enforcement division to ensure compliance with the minimum allowable safety criteria prescribed in section 79-607 and subdivision (13) of section 79-318. Upon successful completion of such inspection, an approval sticker shall be placed by the inspector on the windshield, as specified by the rules and regulations established pursuant to subdivision (13) of section 79-318, and within five days after such inspection, the Nebraska State Patrol or the division shall make a report of its inspection in writing and file one copy of such report with the board of education, governing authority, or the independent contractor and file one copy with the State Department of Education. If any inspection required by the provisions of this section discloses any equipment not in compliance with the minimum allowable safety criteria, the pupil transportation vehicle shall immediately be removed from service until the defects are corrected to the satisfaction of a Nebraska State Patrol or division inspector.

All such boards of education, governing authorities, and independent contractors shall also cause each pupil transportation vehicle used for the transportation of students to be inspected by the Nebraska State Patrol or the patrol's carrier enforcement division for compliance with minimum equipment standards established pursuant to section 79-607 and subdivision (13) of section 79-318 prior to being placed into service for the first time in the State of Nebraska. After such inspection a one-time minimum equipment standards sticker shall be placed by the inspector on the windshield as specified by the rules and regulations established pursuant to subdivision (13) of section 79-318 if the pupil transportation vehicle meets such minimum standards."

001.02 Scope and Application. This Chapter presents the minimum equipment standards required on all vehicles utilized to transport public and nonpublic school students. The following regulations, when addressing subject matter regulated by the Federal Motor Vehicle Safety Standards, (FMVSS), 49 CFR 571.101 et seq., (Appendix I) are identical

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to or additional requirements beyond what is addressed in the FMVSS. Should conflicts be found or arise between the following regulations and the FMVSS, as to the same aspect of performance of a motor vehicle or motor vehicle equipment, the FMVSS or any other applicable provision of federal law or regulation shall supersede these regulations. References incorporated herein are available for viewing at the Nebraska Department of Education, 301 Centennial Mall South, 6th Floor, Lincoln, Nebraska 68509.

001.03 Related Regulations. Additional regulations promulgated by the Nebraska Department of Education dealing with pupil transportation drivers and equipment are: Chapter 91, Driver Qualifications and Requirements for Student Transportation Vehicles; Chapter 92, Operational Procedures of Student Transportation Vehicles; and Chapter 94, Student Transportation Vehicles Safety Inspection Criteria.

001.04 Effective Date of Specifications. Vehicles manufactured prior to or equipment purchased prior to the effective date of this rule used exclusively for the purpose of transporting Nebraska school children, shall meet or exceed the Federal Motor Vehicle Safety Standards (FMVSS) and the Nebraska Department of Education regulations in force when the vehicles were manufactured or new buses or equipment were ordered unless otherwise noted. A vehicle manufactured prior to April 1, 1977, shall not qualify as a student transportation vehicle after January 1, 2000. (Coach style buses as defined in section 003.02 manufactured prior to April 1, 1977, are exempt when used for activity trips.)

001.05 Penalty Provisions. According to Section 79-607 of the Revised Statutes of Nebraska (R.R.S.):

"Any officer or employee of any school district who violates any of the traffic rules or regulations or fails to include obligations to comply with the traffic rules and regulations in any contract executed by him or her on behalf of a school district shall be guilty of a Class V misdemeanor and shall, upon conviction thereof, be subject to removal from office or employment. Any person operating a school bus under contract with a school district who fails to comply with any of such traffic rules and regulations shall be guilty of breach of contract, and such contract shall be canceled after notice and hearing by the responsible officers of such school district;"

and pursuant to Section 79-602 of the Revised Statutes of Nebraska (R.R.S.) which states, in part:

"If the inspection reveals any equipment on the pupil transportation vehicle that is not in compliance with such minimum equipment standards, the vehicle shall not be put into service until such deficiencies are corrected and a minimum equipment standards sticker is placed on such vehicle. Failure to remove pupil transportation vehicles from service due to noncompliance with minimum safety

or minimum equipment standards shall constitute a Class V misdemeanor, and conviction for such offense shall be grounds for dismissal of any employee."

001.06 Placement of Inspection Stickers. Upon successful completion of the inspection by the Nebraska State Patrol or the patrol's carrier enforcement division for compliance with the minimum allowable safety criteria in section 79-607 and subdivision (13) of section 79-318 R.R.S., an approval sticker shall be placed on the lower corner of the front windshield opposite the driver's side provided such sticker does not extend more than 115 mm (4 ½ inches) from the bottom of the windshield and is located outside the area swept by the windshield wipers.

Upon successful completion of the inspection by the Nebraska State Patrol or the patrol's carrier enforcement division for compliance with the minimum equipment standards established pursuant to section 79-607 and subdivision (13) of section 79-318 R.R.S. prior to being placed into service for the first time in Nebraska, the one-time minimum equipment standards sticker shall be placed on the lower corner of the front windshield opposite the driver's side provided such sticker does not extend more than 115 mm (4 ½ inches) from the bottom of the windshield and is located outside the area swept by the windshield wipers.

## 002 Definitions

002.01 Activity Bus shall be a motor vehicle with motive power, except a trailer, designed or modified by the manufacturer, distributor or dealer for carrying 11 or more passengers, excluding the driver, meeting or exceeding this Chapter which at any time would be used to carry school children, students and school personnel exclusively on a school activity trip from a given location to a second location without stopping to load or unload children on the public highways; provided that such transportation service is sponsored and approved by the local school governing board.

002.02 School Bus shall mean a motor vehicle with motive power, except a trailer, designed or modified by the manufacturer, distributor or dealer for carrying eleven (11) or more passengers, excluding the driver, meeting or exceeding the Chapter which at any time is used to carry school children, and school personnel exclusively. Such transportation service must be sponsored and approved by the local school governing board. Vehicles that only carry school children along with other passengers as a part of the operation of a common carrier under the jurisdiction of The Surface Transportation Board or Nebraska Public Service Commission are not included within the definition of school bus.

002.02A Type A School Bus is a conversion or body constructed upon a van-type compact truck or a front-section vehicle and designed for carrying more than 10 persons. This definition includes Type A-1, with a Gross Vehicle Weight Rating (GVWR) over 10,000 pounds and Type A-2, with a GVWR of 10,000 pounds and under.

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002.02B Type B School Bus is a conversion or body constructed and installed upon a van or front-section vehicle chassis, or stripped chassis, with a gross vehicle weight rating of more than 10,000 pounds, and designed for carrying more than 10 persons. Part of the engine is beneath and/or behind the windshield and beside the driver's seat. The entrance door is behind the front wheels.

002.02C Type C School Bus is a body installed upon a flat back cowl chassis with a gross vehicle weight rating of more than 10,000 pounds, and designed for carrying more than 10 persons. All of the engine is in front of the windshield and the entrance door is behind the front wheels.

002.02D Type D School Bus is a body installed upon a chassis with the engine mounted in the front, midship, or rear, with a gross vehicle weight rating of more than 10,000 pounds, and designed for carrying more than 10 persons. The engine may be behind the windshield and beside the driver's seat, it may be at the rear of the bus, behind the rear wheels, or midship between the front and rear axles. The entrance door is ahead of the front wheels.

002.03 Small Vehicle shall be a motor vehicle with motive power, except a trailer, designed or modified by the manufacturer, distributor or dealer for carrying 10 or less passengers, excluding the driver, meeting or exceeding Nebraska Department of Education minimum standards for small vehicles which at any time would be used to carry school children exclusively. Such transportation service must be sponsored and approved by the school governing board. The preceding definition is not intended to include private motor vehicles used exclusively to carry members of the owner's household. "Capacity 10 passengers" shall be posted inside the vehicle in a conspicuous location.

002.04 Student Transportation Vehicle is any vehicle utilized to carry school children as sponsored and approved by the local school governing board and conforms to the Nebraska Department of Education definitions of student transportation vehicles listed as School Bus, Activity Bus, and Small Vehicle in this Chapter, or complies with the provisions applicable to coach buses in Section 003.02 of Chapter 93.

003 Responsibility of the Schools

003.01 Vehicle Purchase and Use. Schools shall not purchase or use student transportation vehicles or equipment which do not comply with the provisions of this Chapter or applicable NDE regulations in effect on the date the vehicles or equipment were manufactured.

003.02 Use of Coach Buses By Schools. Schools may charter or contract for the use of coach buses, (vehicles designed as commercial motor vehicles to carry eleven or more passengers as part of the operation of a common carrier, e.g. "Greyhound buses", etc., which do not meet the minimum standards for school buses/activity buses in Chapters 93

and 94), for use on student activity trips to and from a school or school related/sponsored event or activity without stopping to load or unload children or control traffic on public highways if, as provided in 79-602 R.R.S., such vehicles have been inspected or are subject to inspection under the rules and regulations of the Public Service Commission, Carrier Enforcement Division of the State Patrol, or the Division of Motor Carrier Services pursuant to 75-363 through 75-369.07 R.R.S.

Schools may own and operate coach buses for use on student activity trips if (1) such vehicles are exempt from the inspection under 79-602 R.R.S., or (2) if such vehicles are not exempt from inspection under 79-602 R.R.S., if the board or governing authority has such a vehicle inspected before school opens in the Fall and each 80 days during that part of the year when school is in session by a motor vehicle mechanic it has appointed. The mechanic shall thoroughly inspect every such vehicle as to brakes, lights, windshield wipers, window glass, tires, doors, heaters, defrosting equipment, steering gear, and exhaust system for compliance with the criteria prescribed for these items in Chapter 94. Within five days after such inspection, the mechanic shall make a report of his or her inspection in writing on forms provided by the Department to the local board or governing authority, and the Board or governing authority shall cause any deficiencies to be corrected. The local board or governing authority shall also cause such vehicles to be inspected annually by the State Patrol or carrier enforcement division for compliance with the criteria set forth in this section. The State Patrol or carrier enforcement division shall file such reports and place an approval sticker on such vehicles as detailed in 79-602 R.R.S.

#### 004 Chassis and Body Delivery Requirements

004.01 The body and chassis manufacturer shall provide the following materials and information for direct delivery to the customer:

004.01A Line set tickets for each individual unit.

004.01B A copy of the pre-delivery service performed and verified by a checkout form for each individual unit.

004.01C Warranty book and statement of warranty for each individual unit.

#### 005 School Bus and Activity Bus Chassis Minimum Equipment Standards

005.01 Air Cleaner. The engine intake air cleaner (system) shall be furnished and properly installed by the chassis manufacturer to meet engine specifications. The intake air system for diesel engines shall have an air cleaner restriction indicator properly installed by the chassis manufacturer to meet engine specifications.

005.02 Axles



005.02A The front axle or other type of suspension assembly shall be of sufficient capacity at ground to support that portion of the load as would be imposed by the manufacturer's maximum gross vehicle weight rating.

005.02B The rear axle or other type of suspension assembly shall have a gross weight rating at ground equal to or exceeding that portion of the load as would be imposed by the manufacturer's maximum gross vehicle weight rating.

005.02C The rear axle shall be full-floating type.

005.03 Brakes (Includes Emergency Stopping System & Parking)

005.03A School bus chassis with a manufacturer's rated capacity of 65 passengers or greater shall be equipped with full compressed air brakes.

005.03B The braking system shall include the service brake, an emergency brake that is a part of the service brake system and controlled by the service brake control, and a parking brake.

005.03C Buses using air or vacuum in the operation of the brake system shall be equipped with warning signals, readily audible and visible to the driver, that will give a continuous warning when the air pressure available in the system for braking is 60 psi (pounds per square inch) or less or the vacuum in the system available for braking is eight (8) inches of mercury or less. An illuminated gauge shall be provided that will indicate to the driver the air pressure in pounds per square inch or the inches of mercury vacuum available for the operation of the brakes.

005.03C1 Vacuum-assist brake systems shall have a reservoir used exclusively for brakes that shall adequately ensure a full stroke application that loss in vacuum shall not exceed 30 percent with the engine off. Brake systems on gas-powered engines shall include suitable and convenient connections for the installation of a separate vacuum reservoir.

005.03C2 Any brake system with a dry reservoir shall be equipped with a check valve or equivalent device to ensure that in the event of failure or leakage in its connection to the source of compressed air or vacuum, the stored dry air or vacuum shall not be depleted by the leakage or failure.

005.03C3 An automatic moisture ejection valve and air dryer with heated element shall be provided on all air brake equipped chassis. The moisture ejector valve shall operate each time the air compressor cuts-in or cuts-out or a brake application is made to automatically eject moisture, sludge, and/or foreign matter and maintain a clean dry air line in the air system. The unit shall operate efficiently at high humidity

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and low temperature.

005.03C4 Automatic slack adjusters--bus chassis equipped with compressed air brakes shall be equipped with automatic slack adjuster.

005.03D Buses using a hydraulic-assist brake shall be equipped with warning signals, readily audible and visible to the driver, that will provide continuous warning in the event of a loss of fluid flow from primary source and in the event of discontinuity in that portion of the vehicle electrical system that supplies power to the backup system.

005.03E The brake lines and booster-assist lines shall be protected from excessive heat and vibration and installed in a manner which prevents chafing.

005.03F All brake systems shall be designed to permit visual inspection of brake lining wear without removal of any chassis components.

005.03G Antilock brake systems if used for either air or hydraulic brakes shall include control of all axles, in compliance with Federal Motor Vehicle Safety Standards (FMVSS) 105 or 121.

005.04 Bumper, Front

005.04A All School buses shall be equipped with a front bumper. The front bumper shall be furnished by the chassis manufacturer as part of the chassis on all types of chassis unless there is a specific arrangement between the chassis manufacturer and body manufacturer that the body manufacturer will furnish the front bumper.

005.04B Unless an energy absorbing bumper is used, the front bumper shall be of pressed steel channel or equivalent material at least 3/16 inch thickness and not less than 8 inch wide (high) and shall extend beyond forward-most part of the body, grille, hood, and fenders and shall extend to outer edges of the fenders at the bumper's top line.

005.04C The bumper shall be designed or reinforced so that it will not deform when the bus is lifted by a chain that is passed under the bumper (or through the bumper if holes are provided for this purpose) and attached to both tow eyes. For the purpose of meeting this standard, the bus shall be empty and positioned on a level, hard surface and both tow eyes shall share the load equally.

005.05 Certification

005.05A Chassis manufacturers will certify annually to the Nebraska Department of Education that their product meets or exceeds all applicable Federal and State of Nebraska rules and regulations in effect at the time of construction.

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005.06 Clutch.

005.06A Clutch torque capacity shall be equal to or greater than the engine torque output.

005.07 Color

005.07A Chassis, including wheels and the bumpers, shall be painted black enamel.

005.07B Cowl hood and fenders shall be painted National School Bus Yellow.

005.07C Conventional chassis hoods shall be painted non-reflective National School Bus Yellow with the lowest specular gloss attainable with minimum color variation.

005.07D Grille may be chrome, anodized aluminum finish or painted National School Bus Yellow. (Appendix A)

005.08 Cooling System

005.08A The cooling system radiator shall be of sufficient capacity to cool the motor at all speeds in all gears. Thermostatic controls shall be high temperature type.

005.08B The cooling system fan shall be of heavy-duty reinforced type with clutch type drive. The clutch must automatically control fan.

005.08C The chassis cooling system shall be equipped with heavy-duty truck type water pump.

005.08D Permanent base anti-freeze shall be provided by the chassis manufacturer to protect the cooling system to a minimum of a -40 degrees F when tested at normal engine temperature. (The preceding minimum degree reading shall not be diluted by body company.)

005.08E Supplemental Coolant Additives (SCA) must be maintained as per engine manufacturers standards.

005.09 Drive Shaft. The drive shaft shall be protected by a metal guard or guards of steel or equivalent strength around circumference of the drive shaft to prevent it from whipping through floor or dropping to ground if broken.

005.10 Electrical System

005.10A All buses shall be equipped with a heavy-duty truck or bus type alternator (minimum 21 SI for type C and D buses) having a minimum output rating of 100

amperes. Alternator shall be capable of producing a minimum of 50% of its maximum rated output at the engine manufacturer's recommended idle speed.

005.10B All wiring shall use a standard color and number coding and each chassis shall be delivered with a wiring diagram that coincides with the wiring of the chassis.

005.10C Direct-drive generator or alternator is permissible in lieu of belt drive. Belt drive shall be capable of handling the noted capacity of the generator or alternator with no detrimental effect on other driven components.

005.10D Regulators--regulators shall be full transistor type.

005.10E Chassis manufacturer shall install a readily accessible electrical terminal so that the body and chassis electrical load can be recorded through the chassis ammeter without dismantling or disassembling chassis component. Chassis wiring system to terminal shall have a minimum of 100-ampere capacity. Chassis ammeter and wiring shall be compatible with generating capacity, and ammeter shall be capable to recording continuous draw 100 amperes.

005.10F A suggested method for estimating alternator and battery capacity is contained in APPENDIX B to this Chapter.

005.10G Circuit breakers are required wherever possible on all electrical circuits in lieu of fuses on Type C and D buses.

005.10H Storage battery, as established by manufacturer's rating, shall be of sufficient capacity to care for starting, lighting, signal devices, heating and other electrical equipment compatible with the size of alternator supplied with the chassis.

005.10I When rated in conformance with Society of Automotive Engineers Standards, the battery or batteries shall provide a current flow for the engine cranking no less than the engine manufacturer's recommended cold cranking current (amperes for 30 seconds) at -17.8 degrees Celsius (0 degrees Fahrenheit) or at the purchaser's option. Battery(s) shall provide a reserve capacity (duration of 25 ampere current flow) at 27 degrees Celsius (80 degrees Fahrenheit) no less than 120 minutes.

005.10J Batteries shall be mounted outside of the passenger compartment in an adequate hold down carrier and be readily accessible for service from outside of the passenger compartment. No holes shall be cut nor service doors designed to permit access to the battery from inside the passenger compartment.

005.10K If the battery is not mounted in the engine compartment, it shall be mounted on the side of the chassis. No part of the battery shall extend above the top of the chassis frame. Sufficient amperage size cable shall be provided. Splicing of cable is

prohibited.

005.10L When battery is mounted on the chassis rail by the chassis manufacturer, it shall be the responsibility of the school bus body manufacturer to fabricate and install the battery in a drawer-type pull-out tray to facilitate removal and servicing. The battery shall be enclosed in such a manner as to provide both adequate ventilation and maximum protection from dirt. The battery enclosure shall be constructed of mill-applied zinc steel with adequate drain ports and undercoated.

005.10M Ground cables shall be attached to frame, body and engine by secure fasteners.

005.10N A bolt type battery fastener shall be provided on all battery cables if bolt type battery is used.

#### 005.11 Exhaust System

005.11A Exhaust pipe, muffler, and tailpipe shall be outside the bus body and attached to chassis, so as not to damage any other chassis component.

005.11B Muffler shall be of heavy duty truck type constructed of corrosion resistant material.

005.11C Tailpipe shall be constructed of corrosion resistant tubing of 16 gauge steel or equivalent. Chassis manufacturers shall furnish an exhaust system with tailpipe of sufficient length to exit the rear of the bus or at the left side of the bus body no more than 18 inches forward of the front edge of the rear wheel house opening. If designed to exit at the rear of the bus, the tailpipe shall extend at least five inches beyond the end of the chassis frame. If designed to exit to the side of the bus, the tailpipe shall extend at least 48.5 inches (51.5 inches if the body is to be 102 inches wide) outboard from the chassis centerline.

005.11C1 Type A and B chassis may be furnished with the manufacturer's standard tailpipe configuration.

005.11D Exhaust system on a chassis shall be adequately insulated from fuel system.

005.11E Exhaust may not terminate beneath an emergency exit or fuel fill on Type C and D buses. The exhaust system on vehicles equipped with a power lift unit may be routed to the left of the right frame rail to allow for the installation of a power lift unit on the right side of the vehicle.

005.11F Tail pipe shall not extend more than 2 inches beyond the rear bumper.

005.12 Fenders, Front - Type C Vehicles

005.12A Total spread of out edges of front fenders, measured at fender line, shall exceed the total spread of front tires when front wheels are in a straight ahead position.

005.12B Front fenders on school buses shall be braced and free from any body attachment. Rear bottom edge of front fender shall extend to the bottom of the front body section.

005.12C Chassis sheet metal on conventional school buses shall not extend beyond the rear face of cowl.

005.13 Frame

005.13A The frame shall be designed to correspond with or exceed standard practice performance criteria for trucks of the same general load specifications used for highway service.

005.13B Any secondary manufacturer that modifies the original chassis frame shall guarantee to the vehicle owner or purchaser the workmanship and materials resulting from such modification.

005.13C Holes in top, side and bottom of frame side rail shall not be permitted except as provided in original chassis frame.

005.13D Welding to frame side rails which is necessary by design to strengthen, modify or alter basic vehicle configuration, shall be performed and guaranteed by the body or chassis manufacturer making the modification.

005.13E Frames shall not be modified for the purpose of extending the wheel base.

005.13F Frame lengths shall be provided in accordance with School Bus Manufacturers Institute (SBMI) Design Objectives, 1990 edition, except where body and chassis manufacturer are the same or have established mutual design criteria for the vehicle.

005.14 Fuel Tank

005.14A Fuel tank or tanks having a 30 gallon capacity with a 25 gallon actual draw shall be provided by the chassis manufacturer in a location where accidental fuel spillage will not drip or drain on any part of the exhaust system.

005.14B No portion of the fuel system which is located outside the engine compartment, except the filler tube, shall extend above the top of the chassis frame rail.

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Fuel lines shall be mounted to obtain maximum possible protection from the chassis frame.

005.14C School buses shall have the following fuel tank minimum capacities:

005.14C1 10-46 Passenger--30 gallon minimum capacity

005.14C2 47 Passenger and above--60 gallon minimum capacity

005.14D Fuel tank installation shall be in accordance with SBMI Design Objectives, 1990 edition. In addition, fuel tank(s) may be mounted between the chassis frame rails or outboard of the frame rails on either the left or right side of the vehicle. The actual draw capacity of each fuel tank shall be 83% of the tank capacity.

005.14E Fuel filter with a replaceable element shall be installed between the fuel tank and engine.

005.14F Unless specific agreement has been made between the body and chassis manufacturers, fuel tanks and filler spouts shall not be located in spaces restricted by SBMI Design Objectives, 1990 edition.

005.14G Installation of alternative fuel systems, including fuel tanks and piping from tank to engine, shall comply with all applicable fire codes.

005.14H Installation of Liquefied Petroleum Gas (LPG) tanks shall comply with National Fire Protection Agency (NFPA) Standards 58 (1995).

005.15 Fuel, Alternative. School transportation vehicles may use alternative fuel systems.

005.15A Original equipment manufacturers (OEMs) using compressed natural gas (CNG) shall use dedicated CNG engines and shall comply with NFPA Standard 52 "Compressed Natural Gas Vehicular Fuel Systems" in effect at the time of installation. Fuel systems using liquefied petroleum gas (LPG) shall comply with the 1995, NFPA Standard 58 "Liquefied Petroleum Gases Engine Fuel Systems" in effect at the time of installation.

005.15B All alternative fuel buses shall travel a loaded range of not less than 200 miles, except those powered by electricity which shall travel not less than 80 miles.

005.15C Natural gas powered buses shall be equipped with an interior/exterior gas detection system. All natural gas powered buses shall be equipped with a fire detection and suppression system.

005.15D All materials and assemblies used to transfer or store alternative fuels shall

be installed outside the passenger/driver compartment.

005.15E All Type C and D buses using alternative fuel shall meet the same base requirements of BUS CHASSIS STANDARDS for Power and Gradeability, i.e., at least one published net horsepower per each 185 pounds of GVWR.

005.15F The total weight shall not exceed the GVWR when loaded to rated capacity.

005.15G The manufacturer supplying the alternative fuel equipment must provide the owner and operator with adequate training and certification in fueling procedures, scheduled maintenance, troubleshooting, and repair of alternative fuel equipment.

005.15H All fueling equipment shall be designed specifically for fueling motor vehicles and shall be certified by the manufacturer as meeting all applicable federal, state and industry standards.

005.15I All on-board fuel supply containers shall meet all appropriate requirements of the American Society Mechanical Engineers (ASME) DOT regulations, or applicable FMVSS and NFPA Standards.

005.15J All fuel supply containers shall be securely mounted to withstand a static force of eight times their weight in any direction.

005.15K All safety devices that may discharge to the atmosphere shall be vented to the outside of the vehicle. The discharge line from the safety relief valve on all school buses shall be located in a manner appropriate to the characteristics of the alternative fuel. Discharge line shall not pass through the passenger compartment.

005.15L A positive quick acting (1/4 turn) shut-off control valve shall be installed in the gaseous fuel supply lines as close to the fuel supply containers as possible. The controls for this valve shall be placed in a location easily operable from the exterior of the vehicle. The location of the valve control shall be clearly marked on the exterior surface of the bus.

005.15M A grounding system shall be required for grounding of the fuel system during maintenance related venting.

005.16 Governor. The engine and road speed governors may be installed to limit engine speed to a maximum revolutions per minute as recommended by the engine manufacturer and road speed at a maximum state speed limit or tachometer shall be installed so engine speed may be known to driver.

005.17 Heating System. The chassis engine shall have plugged openings for the purpose of supplying hot water for the bus heating system. The opening shall be suitable for



attaching 3/4 inch pipe thread/hose connector. The engine shall be capable of supplying water having a temperature of at least 170 degrees Fahrenheit at a flow rate of 50 pound/per minute at the return end of 30 feet of one inch inside diameter automotive hot water heater hose. (SBMI Standard No. 001 - Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilation Equipment, 1995).

005.18 Horn

005.18A Bus shall be equipped with dual horns of standard make. Each horn shall be capable of producing complex sounds in bands of audio frequencies between approximately 250 and 2,000 cycles per second and having a total sound level of 110 decibels within these frequency limits when measured at a point on axis of horn 3 feet from exit of horn.

005.18B Sound-level measurements shall be made with a meter that complies with American National Standard S1.4-1972, as promulgated by American National Standards Institute. Measurement shall be made with meter set to a flat response (C weighing network).

005.18C Sound-level measurements shall be made with horns installed on the bus. There shall be no reflecting walls or obstacles other than ground and vehicle closer than 100 feet from horn during sound-level measurements.

005.18D If louder horn is desired, it shall be capable of producing a sound level of 120 decibels under conditions specified above.

005.19 Instruments and Instrument Panel

005.19A Chassis shall be equipped with the following nonglare instruments and gauges (lights in lieu of gauges are not acceptable):

005.19A1 Speedometer which will show speed.

005.19A2 Odometer which will give accrued mileage, (to seven digits) including tenths of miles.

005.19A3 Voltmeter with graduated charge and discharge. Both voltmeter and its wiring to be compatible with generating capacities. Ammeter with graduated charge and discharge, with ammeter and its wiring compatible with generating capacities, is permitted in lieu of voltmeter. (Exempt from Type A Bus.)

005.19A4 Oil-pressure gauge.

005.19A5 Water-temperature indicator.

005.19A6 Fuel gauge.

005.19A7 Upper-beam headlamp indicator.

005.19A8 Automatic transmission fluid temperature gauge. (Exempt from Type A Bus.)

005.19A9 Tachometer. (Exempt from Type A Buses.)

005.19A10 Glow-plug indicator light where appropriate.

005.19A11 A chassis with air brakes shall be equipped with a visible gauge and audible low pressure indicator to warn driver if air pressure in air-brake system falls below 60 psi.

005.19A12 All chassis with a vacuum brake system shall be equipped with a visible low pressure indicator and lighted graduated gauge. The gauge shall be accurate within 10 percent of actual reservoir pressure which will indicate to the driver the vacuum in inches of mercury available for operation of brakes as previously indicated. (Exempt from Type A Bus.)

005.19A13 All chassis with hydraulic electric assist brake systems shall be equipped with a visible low pressure indicator. (Exempt from Type A Bus.)

005.19B All instruments shall be easily accessible for maintenance and repair.

005.19C Above instruments and gauges shall be mounted on instrument panel in such manner that each clearly visible to driver in normal seated position.

005.19D Instrument panel shall have lamps of sufficient candle-power to illuminate all instruments and gauges.

005.19E The bus chassis shall be equipped with a locking type hand throttle or fast idle device designed to be locked in any given position and within easy reach of the driver. (Exempt from Type A and Type B Bus.)

## 005.20 Lamps and Signals

005.20A All lamps and their installation shall conform to current standards and recommended practices of the Society of Automotive Engineers (SAE), 1972.

005.20B The bus shall be equipped with a minimum of two halogen headlamps of proper intensity.

005.20C The bus shall be equipped with manually operated dimmer switch for selection of high or low light beam distribution.

005.20D The school bus shall be equipped with two Class "A" turn signal lamps meeting the Society of Automotive Engineers Standards. The turn signal switch shall be self-canceling, installed as an integral part of the steering column assembly and shall have circuit wires of sufficient length for the connection of the bus turn signals by the school bus body manufacturer.

005.20E The chassis manufacturer shall provide a four-way hazard warning signal switch and flasher that is capable of flashing all four corner turn signal lamps simultaneously. More than one switch is acceptable. When more than one switch is installed, one switch must be mounted on the dash or control panel.

005.21 Oil Filter. Oil filter shall be full-flow type with a replaceable element or cartridge type filtering system and shall be connected by flexible oil lines if it is not of build-in or engine mounted design. Oil filter shall have oil capacity of at least one quart.

005.22 Openings. All openings in floorboard or firewall between chassis and passenger carrying compartment, such as for gearshift lever and auxiliary brake lever, shall be sealed.

#### 005.23 Passenger Load

005.23A Average calculated GVW (Gross Vehicle Weight) is the sum of average weight, plus average body weight, plus 150 pounds for driver's weight, plus total seated pupil weight (based on 120 pounds per pupil).

005.23B Actual gross vehicle weight (GVW) shall not exceed the chassis manufacturer's gross vehicle weight rating (GVWR) for the chassis.

005.24 Power and Gradeability. Gross vehicle weight (GVW) shall not exceed 185 pounds per net published horsepower of the engine at the manufacturer's recommended maximum number of revolutions per minute.

005.25 Retarder System. Retarder system, if used, shall maintain the speed of the fully loaded school bus at 19.0 mph or 30 km/hr on a 7% grade for 3.6 miles or 6 km.

005.26 Shock Absorbers. Bus shall be equipped with front and rear heavy duty double-acting shock absorbers compatible with manufacturer's rated axle capacity at each wheel location.

#### 005.27 Springs

005.27A Springs or suspension assemblies shall be of ample resiliency under all load

conditions and of adequate strength to sustain loaded bus without evidence of overload.

005.27B Springs or suspension assemblies shall be designed to carry their proportional share of GVW in accordance with requirement for weight distribution as specified in 005.23A.

005.27C If leaf-type springs are used, stationary eyes shall be protected by a full wrapper leaf in addition to main leaf.

005.27D If leaf-type rear springs are used, they shall be progressive type.

#### 005.28 Steering Gear

005.28A Power steering is required and shall be of the integral type with integral valves, installed and approved by chassis manufacturer and designed to assure safe and accurate performance under severe conditions when vehicle is operated with maximum load and at maximum speed. The steering system shall be designed to provide means for lubrication of all wear-points, if wear-points are not permanently lubricated.

005.28B Steering mechanism shall provide for easy adjustment for lost motion.

005.28C No changes shall be made in steering apparatus which are not approved by chassis manufacturer.

005.28D There shall be clearance of at least 2 inches between steering wheel and cowl instrument panel, windshield, or any other surface. The surface of the steering wheel assembly shall be nonglare.

#### 005.29 Tires and Rims

005.29A Tires and rims of the proper size and tires with a load rating commensurate with chassis manufacturer's gross vehicle weight rating shall be provided. The use of multipiece rims and/or tube-type tires shall not be permitted on any school bus ordered after December 31, 1998.

005.29B Dual rear tires shall be provided on Type A-1, Type B, Type C and Type D school buses.

005.29C All tires on given vehicle shall be of the same size and ply rating.

005.29D Spare tire, if required, shall be of the same size as those mounted on the vehicle.

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005.29E Chains or snow tires shall be supplied if required by local regulation or warranted by circumstances.

005.29F Recapped tires are permissible as replacements on equipment now in operation for use on rear wheels only.

005.29G Front tires with a tread depth of less than 4/32 inches and rear tires with a tread depth of less than 2/32 inches shall be removed from normal operating conditions.

005.30 Tow Hooks. Tow eyes or hooks shall be furnished on the front end of the frame and attached so as not to project beyond the front bumper. Tow eyes or hooks attached to the frame chassis, shall be furnished by either the chassis or body manufacturer. This installation shall be in accordance with the chassis manufacturer's specifications. (Exempt from Type A2 Buses.)

005.31 Transmission

005.31A A sign permanently displayed in view of the driver, indicating shift level patterns for all transmissions, is required.

005.31B A school bus of a manufacturer's rated capacity of 10-30 passengers equipped with an automatic transmission shall have at least three forward gear ratios. The transmission shift quadrant shall provide three forward drive ranges plus neutral and reverse ranges and shall be equipped with a fluid temperature gauge visible in the driver's compartment.

005.31C All school buses with automatic transmission shall be equipped by the manufacturer with a filter in the transmission or transmission line. (Exempt from Type A Bus.)

005.31D A school bus of a manufacturer's rated capacity greater than 30 passengers, equipped with an automatic transmission, shall have at least four forward gear ratios plus integral torque converter. The transmission shift quadrant shall provide four forward drive ranges plus neutral and reverse ranges and shall be equipped with a fluid temperature gauge visible in the driver's compartment.

005.31E A school bus equipped with a mechanical type transmission shall be synchromesh except first and reverse gears. It shall be of sturdy construction, and input torque capacity shall be at least 10 percent above maximum net torque developed by engine. Its design shall provide not less than four forward and one reverse speeds.

005.32 Turning Radius

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005.32A Chassis with a wheel base of 264 inches or less shall have a right and left turn radius of not more than 42 ½ feet, curb to curb measurement.

005.32B Chassis with a wheel base of 265 inches or more shall have a right and left turning radius of not more than 44 ½ feet, curb to curb measurement.

005.33 Undercoating. The chassis manufacturer or their agent shall coat the undersides of steel or metallic-constructed front fenders with a rust-proofing compound for which compound manufacturers have issued notarized certification of compliance to chassis builder that the compound meets or exceeds all performance and qualitative requirements of paragraph 3.4 of Federal Specification TT-C-520B (1963), using modified tests.

005.34 Weight Distribution. Weight distribution of fully loaded bus on level surface shall be such so as not to exceed the manufacturers front gross axle weight rating and rear gross axle weight rating.

006 School Bus and Activity Bus Body Minimum Equipment Standards

006.01 Aisle

006.01A Aisle shall be unobstructed at all times by any type of barrier, seat, wheelchair or tiedown, unless a flip seat is installed and occupied. A flip seat in the unoccupied (up) position shall not obstruct the 12-inch minimum aisle to any side emergency door.

006.01B Minimum clearance of aisle or passageway between seat rows leading to side emergency doors shall be a minimum of 12 inches at seat level.

006.01C The seat backs shall be slanted sufficiently to give aisle clearance of 15 inches at tops of seat backs.

006.02 Back-up Warning Alarm. An automatic audible alarm shall be installed behind the rear axle and shall comply with the Society of Automotive Engineers (SAE) published Backup Alarm Standards (1972), (SAE 994B) a minimum of 97 dBA.

006.03 Battery

006.03A Battery and cable required to complete circuits without splicing shall be provided by the chassis manufacturer. (See bus Chassis-Electrical System 005.10H-005.10N.)

006.03B The school bus body manufacturer shall provide a drawer-type pull out tray to facilitate servicing or removal of battery. The battery shall be enclosed in such a manner as to provide adequate ventilation and maximum protection from dirt. The battery

enclosure shall be constructed of mill-applied zinc steel with adequate drain ports and appropriate undercoating. Battery compartment door or cover shall be secured by adequate and conveniently operated latch or other type fastener. Battery compartment floor may be constructed of plywood over steel construction. (Exception, Type A Buses.)

#### 006.04 Body Sizes

006.04A The overall width of the school bus shall not exceed 102 inches, excluding accessories.

006.04B Bodies for conventional body-on-chassis type buses shall conform to all applicable provisions of the Federal Motor Vehicle Safety Standards (FMVSS).

006.04C The overall length of the school bus (body and chassis) shall not exceed 40 feet, excluding accessories.

006.04D The minimum inside body height shall be 72 inches measured at any point on longitudinal center line from front vertical bow to rear vertical bow.

#### 006.05 Bumper (Rear)

006.05A Rear bumper shall be of heavy duty type, 3/16 inch pressed steel channel of one piece construction and shall have not less than a 9 ½ inch face after forming. Rear bumpers on Type A buses can be made of other material, provided it is of equal or greater strength as that required above.

006.05B The rear bumper shall be wrapped around back corners of bus. It shall extend forward at least 12 inches, measured from rearmost point of body at floor line.

006.05C Rear bumper shall be attached to chassis frame in such a manner that it may be removed and shall be so braced as to develop full strength of bumper section from rear or side impact.

006.05D Rear bumper shall extend beyond rearmost part of body surface at least 1 inch and shall be so attached as to prevent hitching of rides.

006.05E On a Type D bus, if the chassis manufacturer does not provide bumper, it shall be provided by the body manufacturer. Bumper will conform to standard in section 005.04.

#### 006.06 Certification

006.06A Body manufacturers will certify annually to the Nebraska Department of

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Education that their product meets or exceeds all applicable federal and State of Nebraska rules and regulations in effect at the time of construction.

006.06B Vendors of used school buses shall certify, in writing, to the school bus purchaser that their product meets or exceeds all applicable federal and State of Nebraska rules and regulations in effect at the time of construction.

006.07 Color

006.07A The school bus body shall be painted National School Bus Yellow (Appendix A.)

006.07B The body exterior paint trim shall be black.

006.07C Optionally the roof of the bus may be painted white extending down to within 6 inches above the drip rails on the sides of the body, except that front and rear roof caps shall remain National School Bus Yellow.

006.07D Reflective Material (see Appendix G)

006.07D1 Front and/or rear bumper shall be marked diagonally 45 degrees down to centerline of pavement with 2 inch wide strips of non-contrasting reflective material.

006.07D2 Rear of bus body shall be marked with strips of reflective National School Bus Yellow material using material which conforms with the requirements of FMVSS in effect on date of manufacture. The perimeter marking of rear emergency exits and/or the use of reflective "school bus" signs partially accomplish the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of at least 1 3/4 inches reflective National School Bus Yellow material shall be applied horizontally above the rear windows and above the rear bumper extending from the rear emergency exit perimeter marking outward to the left and right rear corners of the bus; and vertical strips shall be applied at the corners connecting these horizontal strips.

006.07D3 "SCHOOL BUS" signs, if not of lighted design, shall be marked with reflective National School Bus Yellow material comprising background for lettering of the front and/or rear "SCHOOL BUS" signs.

006.07D4 Sides of bus body shall be marked with reflective National School Bus Yellow Material at least 1 3/4 inches in width, extending the length of the bus body and located (vertically) as close as practicable to the beltline.

006.08 Communications. School bus shall be equipped with a two way electronic voice



communication system which can be used at any point on the vehicle's route. The system can be after-market provided.

006.09 Construction

006.09A Construction shall be of prime commercial-quality steel or other metal or other material with a strength at least equivalent to all-steel materials as certified by bus body manufacturer.

006.09B Construction shall provide a reasonable dustproof and watertight unit.

006.09C A Racking Load Test shall be performed to assure adequate shear stiffness and strength of the bus body. The racking load shall be applied along a line connecting the most distant points on a transverse cross section of the bus interior. It produces a shear distortion of the cross section. Bus body (including roof bows, body posts, strainers, stringer, floor, inner and outer linings, rub rails and other reinforcements) shall be of sufficient strength to support entire weight of fully loaded vehicle on its top or side if overturned. Bus body, as unit, shall be designed and built to provide impact and penetration resistance.

006.09D Structural floor shall be of prime commercial-quality steel of at least 14 gauge or other metal or other material at least equal in strength to 14 gauge steel. Floor shall be level from front to back and from side to side except at wheel housing, toeboard and driver's seat platform areas.

006.09E If floor insulation is requested by the local school district, it shall be either 5 ply nominal 5/8 inch thick plywood, or a material of equal or greater strength and insulation R value and it shall equal or exceed properties of exterior-type Douglas fir plywood, C-D Grade, as specified in standard PSI-83 issued by U.S. Department of Commerce (1983). All exposed edges shall be sealed. Type A busses may be equipped with nominal 1/2 inch thick plywood meeting above requirements.

006.09F Two or more roof strainers or longitudinal member shall be provided to connect roof bows, to reinforce flattest portion of roof skin and to space roof bows.

006.09F1 These strainers shall be installed between roof bows or applied externally.

006.09F2 They shall extend from windshield header and, when combined with rear emergency door post, are to function as longitudinal members extending from windshield header to rear floor body cross member.

006.09F3 At all points of contact between strainers or longitudinal members and other structural material, attachment shall be made by means of welding, riveting, or

bolting.

006.09F4 After load, as called for in Static Load Test Code and Racking Load Test, has been removed, none of the following defects shall be evident:

006.09F4a Failure or separation at joints where strainers are fastened to roof bows.

006.09F4b Appreciable difference in deflection between adjacent strainers and roof bows.

006.09F4c Twisting, buckling, or deformation of strainer cross section.

006.09G Side Strainer(s). There shall be one or more side strainers or longitudinal members to connect vertical structural members and to provide impact and penetration resistance in event of contact with other vehicles or objects.

006.09G1 Such strainer(s) shall be formed (not in flat strip) from metal of at least 16 gauge and 3 inches wide or the equivalent.

006.09G2 Side strainer(s) shall be installed in area between bottom of window and bottom of seat frame and shall extend completely around bus body, except for door openings and body cowl panel.

006.09G3 Side strainer(s) shall be fastened to each vertical structural member in any one or any combination of following methods as long as stress continuity of member(s) is maintained:

006.09G3a Installed between vertical members.

006.09G3b Installed behind panels but attached to vertical members.

006.09G3c Installed outside external panels.

006.09G4 Fastening method employed shall be such that the strength of the strainer(s) is fully utilized.

006.09G5 Side strainer(s) or longitudinal member(s) may be combined with one of required rub rails, or be in the form of an additional rub rail, as long as separate conditions and physical requirements for rub rails are met.

006.09G6 No portion of side strainer or longitudinal member is to occupy same vertical position as either rub rail.

006.09H Rear corner reinforcements. Rear corner framing of bus body, between floor and windowsill and between emergency door posts and last horizontally or vertically or in another combination to provide additional impact and penetration resistance equal to that provided by frame members in areas of sides of body. Such structural members shall be securely attached at each end.

006.09I Floor sills. There shall be one main body sill at each side post and two intermediate body sills on approximately 10 inch centers. All sills shall be of equal height not to exceed 3 inches. All sills shall extend the width of body floor except where structural members or features restrict area.

006.09J Main body sill shall be equivalent to or heavier than 10 gauge and each intermediate body sill shall be equivalent to or heavier than 16 gauge, or each of all body sills shall be equivalent to or greater than 14 gauge. All sills shall be permanently attached to floor.

006.09K Connections between sides and floor system shall be capable of distributing loads from vertical posts to all floor sills. As evidence that this requirement is fulfilled, none of the following conditions shall occur during or after application of load, as called for in Static Load Test Code and Racking Load Test:

006.09K1 Appreciable difference in deflection between adjacent sills.

006.09K2 Failure or separation in joints where floor, floor sills and sides connect.

006.09K3 Twisting, buckling, or deformation of floor sills cross sections.

006.09L Either each main floor sill, or every floor sill, if all are 14 gauge, shall be attached to the main side rails and shall be of such strength that the attachment equals the strength of the sill at the point of attachment.

006.09M All openings between chassis and passenger-carrying compartment made due to alterations by body manufacturer must be sealed.

#### 006.10 Defrosters

006.10A All school buses shall be equipped with defrosters of sufficient capacity to keep windshield, window to left of driver and glass in entrance door clear of fog, frost and snow. This may be done by using snorkel type supplemented with the use of fans.

006.10B The defroster and defogging system shall be capable of furnishing heated outside ambient air except that part of the system furnishing additional air to the windshield, entrance door and stepwell may be of the recirculating air type.

006.10C Auxiliary fans are not considered defrosting or defogging systems.

006.10D Portable heaters shall not be used.

## 006.11 Doors

### 006.11A Service Door

006.11A1 Service door shall be power or manually operated, hand lever type, under control of driver, and so designed as to afford easy release and provide a positive latching device on manual operating door so as to prevent accidental opening.

006.11A2 Service door shall be located on right side of bus opposite driver within direct view of driver.

006.11A3 Service door shall have a minimum horizontal opening of 24 inches and a minimum vertical opening of 68 inches.

006.11A4 Service door shall be of split type, sedan type, or jackknife type. (Split type door includes any sectioned door which divides and opens inward or outward, front section shall open outward.)

006.11A5 Lower, as well as upper, panels shall be of safety glass. Bottom of lower glass panel shall not be more than 35 inches from the ground when bus is unloaded. Top of upper glass panel shall not be more than 6 inches from the top of door.

006.11A6 Vertical closing edges shall be equipped with flexible material to protect children's fingers.

006.11A7 There shall be no door to the immediate left of driver. (Exception: Type A Bus.)

006.11A8 Power operated doors must be equipped with an emergency release, readily accessible in the door area, so that the door may be opened in the case of an emergency or a power failure.

006.11A9 Padding shall be 3 inches wide and 1 inch thick and extend full width of the door opening on the inside area above the service door to prevent injury.

### 006.11B Emergency door and emergency window.

006.11B1 Emergency door shall be located in center of rear end of bus or in rear half of left or right side of bus if engine or storage compartment is so located as to make it impossible to place door in center of rear end.

006.11B2 Emergency door shall have a minimum horizontal opening of 24 inches and a minimum vertical opening of 48 inches measured from the floor level.

006.11B3 Emergency door shall be hinged on the right side if in the rear end of bus and on the front side if in the left or right side of bus. It shall open outward and shall be labeled inside to indicate how it operates. A device shall be used that holds the door open to prevent the emergency door from closing during emergencies and school bus evacuation drills.

006.11B4 Upper portion of rear emergency door shall be equipped with safety glazing, exposed area of which shall be not less than 400 square inches. The lower portion of the rear emergency door on Type B, C and D vehicles shall be equipped with safety glazing, exposed area of which shall not be less than 350 square inches.

006.11B5 There shall be no steps leading to the emergency door.

006.11B6 No seat or other object shall be so placed in bus as to restrict any part of passageway leading to either rear or left-side emergency door. The passage way shall not have an opening smaller than a rectangle of 12 inches in width and 48 inches in height, measured from floor level.

006.11B7 Words "EMERGENCY DOOR," both inside and outside in letters at least 2 inches high, shall be placed directly above emergency door.

006.11B8 The emergency door shall be equipped with padding at the top edge of each door opening. Pad shall be at least 3 inches wide and 1 inch thick and extend the full width of the door opening.

006.11B9 The side emergency door, if installed, must meet the requirements of FMVSS in effect on date of manufacture regardless of its use with any other combination of emergency exits.

006.11B10 There shall be no obstruction higher than ¼ inch across the bottom of any emergency door opening.

006.11B11 Words "EMERGENCY EXIT," in letters at least 2 inches high, shall be placed directly above emergency window on inside and directly below it on outside.

006.11B12 Emergency door and emergency window shall be designed to be opened from inside and outside of bus and shall be equipped with a fastening device which may be quickly released, but is designed to offer protection against accidental release. Control from driver's seat shall not be permitted. Provision for opening from outside shall consist of nondetachable device so designed as to prevent hitching-to, but to permit opening when necessary, and that there shall be no

exterior body projections around the emergency window or door other than the proper opening controls, which would be apt to injure pupils escaping therefrom.

006.11B13 Emergency door shall be equipped with slide-bar, cam-operated lock. Slide bar shall have minimum stroke of one inch. Emergency door lock shall be equipped with suitable electric plunger-type switch connected with buzzer located in driver's compartment. Switch shall be enclosed in metal case, and wires leading from switch shall be concealed in bus body. Switch shall be so installed that plunger contacts farthest edge of slide bar in such manner that any movement of slide bar will immediately close circuit on switch and activate buzzer.

006.11B14 Emergency door lock shall be equipped with interior handle that extends approximately to center of emergency door. It shall lift up to release lock. When a key or slide lock is provided, the circuit to the ignition switch cannot be completed until the door lock is in an unlocked position.

006.11B15 Emergency exits shall be equipped with latch (or latches) on inside, connected with electric buzzer that will actuate when latch is being released.

006.11B16 Emergency windows located on side of bus, if used, shall be push-out type, split sash, hinged at top, equipped with latch on inside connect with electric buzzer.

006.11B17 Type A, B, C and D vehicles shall be equipped with emergency exits in the following capacity vehicles:

006.11B17a (0) to (42) Passenger = (1) emergency exit per side and (1) roof hatch.

006.11B17b (43) to (78) Passenger = (2) emergency exits per side and (2) roof hatches.

006.11B17c (79 and above) Passenger = (3) emergency exits per side and (2) roof hatches.

006.11B18 Each emergency exit shall comply with FMVSS in effect on date of manufacture. These emergency exits are in addition to the rear emergency door or exit. In addition to the audible warning required on emergency doors, additional emergency exits shall be likewise protected.

## 006.12 Floor, Covering

006.12A Floor in underseat area, including tops of wheel housings, driver's compartment, and toeboard, shall be covered with fire-resistant rubber floor covering or

equivalent having a minimum overall thickness of .125 in.

006.12B Floor covering in aisle shall be of aisle-type fire-resistant rubber or equivalent, non-skid, wear-resistant, and ribbed. Minimum overall thickness shall be .1870 in. measured from tops of ribs.

006.12C Floor covering must be permanently bonded to floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be of type recommended by manufacturer of floor-covering material. All seams must be sealed with waterproof sealer.

006.12D Cove molding shall be used along the side walls and rear corners and all floor seam separations shall be covered with durable metal stripping.

006.12E The entrance stop treads, including the edge at floor level shall be of the same quality as the aisle material. Step treads shall have an integral white nosing of 1 ½ in. or more or use diagonal stripes. Treads shall be permanently bonded to the metal steps and sealed to prevent water from getting underneath the step tread.

006.12F Shall provide a screw down plate to access fuel tank sending unit that is secured and insulated. (Exempt Type A Bus.)

#### 006.13 Fuel Fill Cap Cover

006.13A The fuel fill cap opening in the body skirt shall be equipped with a hinged cover held closed by a spring or other conveniently operated device. (Exception Type A Buses.)

006.13B The type of engine fuel shall be labeled on or above the fuel cap cover.

#### 006.14 Heaters

006.14A Heaters shall be of hot water type and/or combustion type.

006.14B If only one heater is used, it shall be the fresh air type or the combination fresh air and recirculating air type. One heater shall be installed near the right front entrance.

006.14C If more than one hot water heater is used, additional heaters may be of recirculating air type.

006.14D The heating system shall be capable of maintaining bus interior temperatures as specified in Society of Automotive Engineers test procedure J2233 (1995).

006.14E Auxiliary fuel-fired heating systems are permitted, provided they comply with

the following:

006.14E1 The auxiliary heating system fuel shall utilize the same type fuel as specified for the vehicle engine.

006.14E2 Heater(s) may be direct hot air or connected to the engine's coolant system.

006.14E3 Auxiliary heating system, when connected to the engine's coolant system, may be used to preheat the engine coolant or preheat and add supplementary heat to the bus's heating system.

006.14E4 Auxiliary heating systems shall be installed pursuant to the manufacturer's recommendations and shall not direct exhaust in such a manner that will endanger bus passengers.

006.14E5 Auxiliary heating systems which operate on diesel fuel shall be capable of operating on #1, #2 or blended diesel fuel without the need for system adjustment.

006.14E6 The auxiliary heating system shall be low voltage.

006.14E7 Auxiliary heating systems shall comply with all applicable FMVSS in effect on date of manufacture, as well as SAE test procedures.

006.14F All heaters installed shall bear a nameplate rating in accordance School Bus Manufacture Institute (SBMI) Standard #001 (1995), to be affixed by heater manufacturer.

006.14G Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or sharp edges and shall not interfere with or restrict the operation of any engine function, such as the spark advance of an automatic distributor. Heater hose shall conform to the standards of the Society of Automotive Engineers Standard J20c.

006.14H Each hot water system installed by a body manufacturer shall include one shut-off valve in the pressure line and one shut-off valve in the return line with both valves at the engine in an accessible location, except that on all Type A and B buses the valves may be installed in another accessible location.

006.14I There shall be a water flow regulating valve installed in the pressure line for convenient operation by the driver while seated.

006.14J Accessible bleeder valves shall be installed in an appropriate place in the



return lines of body company-installed heaters to remove air from the heater lines.

006.14K All combustion type heaters shall be approved by Underwriters Laboratories (U.L. Inc.), and shall be in compliance with Federal Motor Carrier Safety Regulations in effect on date of manufacture.

006.14L Access panels shall be provided to make heater motors, cores, and fans readily accessible for service. Outside access panel may be provided for the driver's heater.

006.15 Identification

006.15A Body shall bear words "SCHOOL BUS" in black letters at least 8 inches high on both front and rear of body. Lettering shall be placed as high as possible without impairment of its visibility. Lettering shall conform to "Series B" of Standard Alphabets for Highway Signs, Department of Transportation Title 23, U.S. Code, Sections 109(b), 109(d) and 402(a) 11-13-70. "School Bus" lettering shall have a reflective background or may be illuminated by backlighting.

006.15B School buses shall bear only signs and lettering of the official name of the school or company on each side in black, standard, unshaded letters, 5 inches in height in the beltline. If there is insufficient space due to the length of the name of the school district, the words community, independent, consolidated, township, and district may be abbreviated.

006.15C The manufacturer's rated pupil seating capacity shall be printed to the left of the entrance door on the lower skirt in 2 inch characters. The word "capacity" shall also be shown on the inside upper portion of the entrance door or inside above the windshield.

006.15D The numbering of individual buses for identification purposes is permissible. Numerals shall be black and no more than 5 inches in height. The location of the number is at the discretion of the local district except that the number of the bus shall not be on the same line as the number of the district.

006.15E Lettering and numerals shall be painted or may be a pressure sensitive marking of similar performance quality.

006.15F Other lettering, numbering, or symbols which may be displayed on the exterior of the bus shall be limited to:

006.15F1 Symbols identifying the bus as equipped for or transporting students with special needs.

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006.15F2 Manufacturer, dealer or school logo are permissible above windows on side of bus.

006.16 Insulation

006.16A The school bus body shall be fully insulated in the roof and all body panels to deaden sound, reduce vibrations, and reduce the transfer of heat.

006.16B The school bus body side walls and ceilings shall be insulated with a fire resistant material of a type approved by Underwriters Laboratories Inc., and which has a thermal insulation R value of 5.5 at least equivalent to 1½ inch thickness of fiber glass in addition to the usual sprayed-on material. All insulation shall be firmly installed so that it will retain its original position.

006.17 Interior

006.17A Interior of school bus body shall have steel or equivalent strength material, inner linings on ceilings and walls and be free of all unnecessary projections, which includes attendant hand rails, to minimize the potential for injury. This standard requires inner lining on ceilings and walls. If ceiling is constructed to contain lapped joints, forward panel shall be lapped by rear panel and exposed edges shall be beaded, hemmed, flanged, or otherwise treated to minimize sharp edges.

006.17B All school bus bodies shall have steel inner linings on ceilings and walls.

006.17C The driver's area forward of the foremost padded barriers will permit the mounting of required safety equipment and vehicle operation equipment.

006.17D Every school bus shall be constructed so that the noise level taken at the ear of the occupant nearest to the primary vehicle noise source shall not exceed 85 dBA when tested according to the procedure found in Appendix F Noise Test Procedure.

006.18 Lamps and Signals

006.18A Interior lamps shall be provided which adequately illuminate aisle and stepwell. Stepwell light may be illuminated by a service door operated switch, to illuminate only when headlights and clearance lights are on and service door is open.

006.18B Body instrument panel lights shall be controlled by an independent rheostat switch.

006.18C School Bus Alternately Flashing Signal Lamps.

006.18C1 Bus shall be equipped with two red lamps at the rear of vehicle and two

red lamps at the front of the vehicle.

006.18C2 In addition to the four red lamps described above, four amber lamps shall be installed so that one amber lamp is located near each red signal lamp, at same level, but closer to vertical centerline of bus. The system of red and amber signal lamps shall be wired so that automatically energized (with amber lamps being automatically deenergized) when stop signal arm is extended or when bus service door is opened. An amber pilot light and a red pilot light shall be installed adjacent to the driver controls for the flashing signal lamp to indicate to the driver which lamp system is activated.

006.18C3 Area around lens of each alternately flashing signal lamp and extending outward approximately 3 inches shall be black in color. In installations where there is no flat vertical portion of body immediately surrounding entire lens of lamp, a circular or square band of black approximately 3 inches wide, immediately below and to both sides of the lens, shall be black in color on body or roof area against which signal lamp is seen (from distance of 500 feet along axis of vehicle). Visors or hoods, black in color, with a minimum depth of 4 inches shall be provided.

006.18C4 Red lamps shall flash at any time the stop signal arm is extended.

006.18C5 All flashers for alternately flashing red and amber signal lamps shall be enclosed in the body in a readily accessible location.

#### 006.18D Turn Signal and Stop/Tail Lamps

006.18D1 Bus body shall be equipped with amber rear turn signal lamps that are at least 7 inches in diameter or if a shape other than round, a minimum 38 square inches of illuminated area and meet SAE J2068 (1994) specifications. These signals must be connected to the chassis hazard wiring switch to cause simultaneous flashing of turn signal lamps when needed as vehicular traffic hazard warning. Turn signal lamps are to be placed as wide apart as practical and their centerline shall be 7 to 9 inches below the rear window. Type A-II conversion vehicle lamps must be at least 21 square inches in lens area and be in manufacturer's standard color.

006.18D2 Buses shall be equipped with amber side-mounted turn signal lights. The turn signal light on the left side shall be mounted rearward of the stopsignal arm and the turn signal on the right side shall be mounted rearward of the service door.

006.18D3 Buses shall be equipped with four combination red stop/tail lamps:

006.18D3a Two combination lamps with a minimum diameter of 7 inches, or if a shape other than round, a minimum 38 square inches of illuminated area shall be

mounted on the rear of the bus just inside the turn signals.

006.18D3b Two combination lamps with a minimum diameter of 4 inches, or if a shape other than round, a minimum 12 square inches of illuminated area shall be placed on the rear of the body between the beltline and the floor line. Rear license plate lamp may be combined with one lower tail lamp. Stop lamps shall be activated by the service brakes and shall emit a steady light when illuminated.

006.18D3c On buses equipped with a monitor for the front and rear lamps of the school bus, the monitor shall be mounted in full view of the driver. If the full circuit current passes through the monitor, each circuit shall be protected by a fuse or circuit breaker against any short circuit or intermittent shorts.

006.18E Clearance-marker and identification lamps.

006.18E1 The body shall be equipped with two red clearance lights at the rear and two amber clearance lights at the front mounted as high as possible on permanent structure of bus in such a manner as to indicate extreme width of body.

006.18E2 All buses over 30 feet long shall be equipped with one amber intermediate side marker light on each side located midway between the front and rear clearance lights.

006.18E3 The bus shall be equipped with three amber identification lights on the front and three red identification lights on the rear. Each individual light within such group or cluster shall be evenly spaced not less than 6 inches nor more than 12 inches apart along a horizontal line near the top roof edge of the vehicle.

006.18F A white flashing strobe light shall be installed on the roof of a school bus, not to exceed 1/3 the body length forward from the rear of the roof edge. The light shall have a single clear lens emitting light 360 degrees around its vertical axis. A manual switch and a pilot light shall be included to indicate when light is in operation.

006.18G Backup Lamps. Bus body shall be equipped with two white rear backup lamp signals that are at least 4 inches diameter or, if a shape other than round, a minimum of 13 square inches of illuminated area, meeting SAE specifications. If backup lamps are placed on the same line as the brake lights and turn signals, they shall be to the inside.

006.18H Reflex Reflectors

006.18H1 The bus shall be equipped with two amber reflectors: One on each side of body located approximately at floor level and back of the door on the right side and at a similar forward position on the left side.

006.18H2 The bus shall be equipped with four red reflectors: One on each side as far to the rear as possible and two on the rear as far apart as practicable.

006.18H3 All buses over 30 feet long shall be equipped with additional intermediate amber reflectors which shall be located at or near the midpoint between the front and rear side reflector.

006.18H4 The reflectors are to be mounted at a height of not less than 15 inches nor more than 60 inches above the ground on which the vehicle stands.

006.18I License Plate Lamp. Bus shall be equipped with rear license plate illuminator. This lamp may be combined with one of tail lamps.

#### 006.19 Metal Treatment

006.19A All metal used in construction of bus body shall be zinc or aluminum coated or treated by equivalent process before bus is constructed. (Included are such items as structural members, inside and outside panels, floor panels, and floor sills; excluded are door handles, grab handles, stanchions, interior decorative parts, and other interior parts.)

006.19B All metal parts that will be painted shall be (in addition to above requirements) chemically cleaned, etched, zinc-phosphate coated, and zinc-chromate or epoxy-primed or conditioned by equivalent process.

006.19C In providing for these requirements, particular attention shall be given to lapped surfaces, welded connections or structural members, cut edges, punched or drilled hole areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subjected to abrasion during vehicle operation.

#### 006.20 Mirrors

006.20A Interior mirror shall be either clear view laminated glass or clear view glass bonded to a backing which retains the glass in the event of breakage. Mirror shall have rounded corners and protected edges. All Type A buses shall have a minimum of a 6" x 16" mirror and Type B, C, and D buses shall have a minimum of a 6" x 30" mirror.

006.20B Each school bus shall be equipped with a system of exterior mirrors meeting the requirements of FMVSS in effect on date of manufacture.

006.20C This system of mirrors shall be easily adjustable, but be rigidly braced so as to reduce vibration.

#### 006.21 Mounting

006.21A Chassis frame shall extend to the rear edge of rear body cross member. Bus body shall be attached to chassis frame in such manner as to prevent shifting or separation of body from chassis under severe operating conditions.

006.21B Insulating material shall be placed at all contact points between the body and chassis frame on Type A, B, C and D buses, and shall be so attached to chassis frame or body member that it will not move under severe operating conditions.

#### 006.22 Rub Rails

006.22A There shall be one rub rail located on each side of the bus approximately at seat level which will extend from rear side of the entrance door completely around bus body (except for emergency door or any maintenance access door) to a point of curvature near outside cowl on the left side.

006.22B There shall be one rub rail located approximately at floor line which shall cover the same longitudinal area as upper rub rail, except at wheel housings, and shall extend only to radii or right and left rear corners.

006.22C There shall be one rub rail or equivalent bracing located on each side of the bus near the bottom of the side skirts.

006.22D Rub rails shall be attached at each body post and all other upright structural members.

006.22E Rub rails shall be 4 inches or more in width, shall be of 16 gauge steel, or equivalent strength material, and shall be constructed in corrugated or ribbed fashion.

006.22F Rub rails shall be applied outside the body or outside the body posts. Pressed-in or snap-on rub rails do not satisfy this requirement.

#### 006.23 Safety Equipment

006.23A The bus shall be equipped with at least one pressurized, dry chemical-type fire extinguisher, with hose, mounted in the extinguisher manufacturer's bracket of automotive type, and located in the driver's compartment in full view of and readily accessible to the driver. A pressure gauge shall be so mounted on the extinguisher as to be easily read without removing the extinguisher from its mounted position.

006.23B The bus body shall be equipped with at least one 5-pound fire extinguisher or two 2 ½-pound fire extinguishers of a type approved by the Underwriters' Laboratories, Inc. with a total rating of not less than 2A10-B:C. The operating mechanism shall be sealed with a type of seal that will not interfere with use of the fire extinguisher.

006.23C An automatic fire extinguisher system may be installed which consists of an extinguishing agent NAF S-III at 195 PSI or Halon 1211 at 100 PSI pressurized with nitrogen contained in a canister constructed per dot 4 B-240-ET, burst pressure rated at 1170 PSI minimum. The discharge spray nozzle may be pendant or umbrella type spray nozzle of the viking micromatic type. Thermal release mechanism is of quart 201D type alcohol filled bulb with a pre-set thermal release temperature at 286 F. If installed the extinguisher system shall be mounted in a bracket in an appropriate location.

006.23D The bus shall carry a removable, moistureproof and dustproof first aid kit or kits which will consist of the items in Appendix C of this Chapter.

006.23E All school bus bodies with a manufacturer's rated seating capacity of 30 or less shall be equipped with one first aid kit.

006.23F All school bus bodies with a manufacturer's rated seating capacity greater than 30 shall be equipped with two first aid kits.

006.23G When two first aid kits are carried on the bus, one kit shall be mounted over the rear exit door and the other in an accessible location visible to everyone on the bus.

006.23H The school bus shall carry three (3) red and orange emergency reflective triangles.

006.23I Each bus shall have a removable and moistureproof body fluid clean-up kit. It shall be securely mounted and identified as a body fluid clean-up kit. (See Appendix D.) Exception-NR (not required) on buses manufactured prior to 1991.

006.23J If a bus has a trash container it shall:

006.23J1 Be of UL classified fire resistant polyethylene or equivalent material.

006.23J2 Be no greater than 14 quart capacity.

006.23J3 Be secured by a holding device that is designed to prevent movement and to allow easy removal and replacement.

006.23J4 Be installed in an accessible location in the driver's compartment, not obstructing passenger use of the service door.

#### 006.24 Seat Belts

006.24A A Type 2 lap belt/shoulder harness seat belt shall be provided for the driver and must meet FMVSS in effect on date of manufacture.

006.24A1 In addition the assembly shall be equipped with an emergency locking retractor for the continuous belt system. On all buses except Type A equipped with standard chassis manufacturer's driver's seat, the lap portion of the belt shall be guided or anchored so as to prevent the driver from sliding sideways under it.

006.24B Type A buses shall have seat belts for all passengers and shall comply with FMVSS in effect on date of manufacture.

#### 006.25 Seats

006.25A All seats shall have a minimum depth of 15 inches and a minimum vertical height of a cushion to top rail of at least 22 inches with a minimum knee room of no less than 25 inches.

006.25B In determining seating capacity of bus, allowable average rump width will be 13 inches where 3-3 seating plan is used and 15 inches where 3-2 seating plan is used, The manufacturer's rated seating capacity shall be posted inside the bus above the windshield and on the exterior to the left of the entrance door.

006.25C All seats shall be forward facing and shall be securely fastened with bolts and washers to the part or parts of school bus body which supports them and the mounting shall withstand 20 g horizontal loading force.

006.25D Each seat leg shall be secured to the floor by a minimum of two bolts, washers and nuts.

006.25E All seat frames shall be fastened to the seat rail with two bolts, washers and nuts or flange-headed nuts.

006.25F No bus shall be equipped with jump seats or portable seats.

006.25G Forward-most pupil seat on right side of bus shall be located so as not to interfere with driver's vision, not farther forward than guard rail behind driver or rear of driver's seat when adjusted to its rear-most position.

006.25H The minimum seat spacing shall be no less than 25 inch knee room measured at cushion height at the transverse centerline of the seat. The distance between driver's seat when adjusted to its rear-most position and front face of the seat back of the forward-most pupil seat on the left side of the bus shall not be less than 22 inches measured at cushion height.

006.25I All restraining barriers, upholstered areas, driver and passenger seats, including seat bottom, shall be covered with a material that meets the criteria contained



in the School Bus Seat Upholstery Fire Block Test. (See Appendix E.)

006.25J Minimum distance between steering wheel and back rest of driver's seat shall be 11 inches. Driver's seat may be a suspension type seat of the highback type with a minimum seat back adjustment of 15 degrees not requiring the use of tools and with a head restraint to accommodate a 95 percentile adult male (95 percentile adult male as defined in FMVSS in effect on date of manufacture). The driver's seat shall be secured with nuts, bolts, and washers or flange-headed nuts.

006.25K Minimum of 36 inch headroom for sitting position above top of underpressed cushion line of all seats shall be provided. Measurement shall be made vertically not more than 7 inches from side wall at cushion height and at fore and aft center of cushion.

006.25L Backs of all seats of similar size shall be of same width at top and of same height from floor and shall slant at same angle with floor.

006.25M Passenger seat cushion retention system shall be employed to prevent passenger seat cushions from disengaging from seat frames in event of accident. Each seat cushion retention system shall be capable of withstanding vertical static load equal to minimum of five times weight of cushion. System shall also be capable of withstanding forward or rearward static load equal to twenty times the weight of the cushion.

006.25N All school bus passengers' seats, regardless of construction or design, shall have the horizontal seat back top completely padded. The side rails of all school bus passenger seats shall have padding which extends to the seat cushion level. Side rails shall be padded in such a manner as to maintain the 12 inch aisle. In addition, seat construction and padding shall comply with Federal Motor Vehicle Safety Standards in effect on date of manufacture.

006.25O In addition, seat belts installed by retrofits must be installed on seats that meet the FMVSS.

006.25P Each bus shall be equipped with padded shoulder rails in all seated areas.

006.26 Seat Barrier. The right hand seat barrier shall include a modesty panel from barrier to floor and comply to Federal Motor Vehicle Safety Standards in effect on date of manufacture.

#### 006.27 Steps

006.27A First step at service door shall be not less than 10 inches and not more than 14 inches from ground, based on standard chassis specifications. Type D vehicles

shall have the first step at the service door 12 inches to 16 inches from the ground.

006.27B Service door entrance may be equipped with two-step or three-step step-well. Step risers shall not exceed a height of 10 inches, however, with plywood floor on steel, the differential may be increased by thickness of plywood used.

006.27C Steps shall be enclosed to prevent accumulation of ice and snow.

006.27D Steps shall not protrude beyond side body line.

006.27E A handrail device shall be designed and installed to prevent injury or fatality to passengers from being dragged. At least one such device shall assist passengers during entry or egress, and be of such design so as to eliminate entanglement.

006.27F All steps, including floor line platform area shall be covered with 3/16 inch rubber floor covering or other material equal in wear resistance and abrasion resistance to top grade rubber.

006.27G Metal back of tread, minimum 24-gauge cold roll steel, shall be permanently bonded to ribbed rubber; grooved design shall be such that said grooves run at 90-degree angle to long dimension of step tread.

006.27H Three - sixteenth inch ribbed step tread and landing shall have a 1½ inch white nosing as integral piece without any joint.

006.27I Rubber portion of step treads shall have the following characteristics:

006.27I1 Special compounding for good abrasion resistance of high coefficient of friction.

006.27I2 Flexibility so that it can be bent around a ½ inch mandrel both at 130E and 20E Fahrenheit without breaking, cracking or crazing.

006.27I3 Show a durometer hardness of 85 to 95.

006.28 Stirrup Steps. There may be one stirrup step and a handle suitably located on each side of front of body or equivalent mounting for necessary accessibility for cleaning windshield and lamps. Steps are permitted in or on the front bumper, in lieu of the stirrup steps, if the windshield and lamps are easily accessible for cleaning from that position.

#### 006.29 Stop Signal Arm

006.29A The stop signal arm shall be a flat 18 inch octagon, exclusive of brackets for

mounting. The stop signal arm shall contain two alternately flashing red lamps, one located near the top and one located near the bottom of the sign which shows both to the front and to the rear. The flashing red lamps shall be connected to the alternately flashing warning signal lamp master control system. Stop signal must meet Society of Automotive Engineers Standards J1133 (1996).

006.29B The arm shall be constructed of aluminum alloy with a minimum gauge of .080 and temper of 5052-H34 or equivalent.

006.29C It shall have the word "STOP" printed on both sides in white letters at least 6 inches high, with a brush stroke of approximately 7/8 inch width, on a bright red background. The outer edge shall be painted white 1/2 inch wide.

006.29D The colors shall conform to the colors shown and specified in the American Association of State Highway Officials Manual for Signing and Pavement Marking of the National System of Interstate and Defense Highway Title 23, U.S. Code, Sections 109(b), 109(d) and 402(a). In addition, the colors shall be the same in daylight and at night under artificial headlight illumination.

006.29E The entire sign, including letters, shall be high intensity reflectorized with SCOTCHLITE or equivalent, and must not lose over 10 percent of reflectivity when wet.

006.29F The sign shall be mounted outside the bus on the left side below the driver window. Rubber spacers shall be installed on either the side of the bus or the stop arm so as to prevent sign from making abrasive contact with the side of the bus.

006.29G It shall have a driver controlled mechanism, either manual, electrical, vacuum or air which will positively hold the sign in an extended or retracted position to prevent whipping in the wind. Wind guards shall be provided.

006.29H An additional vacuum reserve tank with a minimum capacity of 1,000 cubic inches with check valve is required for vacuum-controlled arm.

006.29I The control mechanism must be mounted so that driver will remain in normal driving position while operating the stop signal arm.

006.29J The stop arm may be designed with high intensity Light Emitting Diodes (LEDs) that flash and spell the word "stop".

006.30 Storage Compartment. A metal container of adequate strength and capacity for storage of tire chains, tow chains, and such tools as may be necessary for minor emergency repairs while bus is enroute may be provided. Such storage container may be located either inside or outside the passenger compartment but, if inside, it shall be capable of being securely latched and be fastened to the floor convenient to either the

service or emergency door. It shall have a cover other than the seat cushion which shall be securely fastened to it in such a manner as to prevent the contents from spilling in case the bus overturns.

006.31 Sun Shield

006.31A On Type B, C and D vehicles, an interior transparent, adjustable, double bracketed sun visor shall be installed that is not less than 6 inches wide and 30 inches long with a finished edge.

006.31B On Type A buses the sunshield shall be manufacturer's standard.

006.32 Traction Assisting Devices

006.32A Where required or used, sanders shall:

006.32A1 Be of hopper cartridge - valve type.

006.32A2 Have metal hopper with all interior surfaces treated to prevent condensation of moisture.

006.32A3 Be of at least 100 pound (grit) capacity.

006.32A4 Have cover on filler opening of hopper, which screws into place, sealing unit airtight.

006.32A5 Have discharge tubes extending to front of each rear wheel under fender.

006.32A6 Have no-clogging discharge tubes with slush-proof, nonfreezing rubber nozzles.

006.32A7 Be operated by electric switch with telltale pilot light mounted on instrument panel.

006.32A8 Be exclusively driver controlled.

006.32A9 Have gauge to indicate hopper needs refilling when it is down to one-quarter full.

006.33 Tow Hooks. The school bus shall be equipped with two heavy-duty tow hooks fastened securely to the rear end of the frame and shall not protrude beyond outer edge of the bumper. (Exempt from Type A2 Buses.)

006.34 Undercoating

006.34A Entire underside of bus body, including floor sections, cross member and below floor line side panels, shall be coated with rust-proofing compound for which compound manufacturer has issued notarized certification of compliance to the bus body builder that compound meets or exceeds all performance and qualitative requirements of paragraph 3.4 of Federal Specification TT-C-520b 1963 using modified test procedures for following requirements:

006.34A1 Salt spray resistance-pass test modified to 5% salt and 1000 hours.

006.34A2 Abrasion resistance-pass

006.34A3 Fire resistance-pass

006.34B Test panels are to be prepared in accordance with paragraph 4.6.12 of TT-C-520b with modified procedure requiring that tests be made on a 48 hour air cured film at thickness recommended by compound manufacturer.

006.34C Undercoating compound shall be applied with suitable airless or conventional spray equipment to recommended film thickness and shall show no evidence of voids in cured film.

#### 006.35 Ventilation

006.35A Body shall be equipped with suitable, controlled ventilating system of sufficient capacity to maintain proper quantity of air under operating conditions without opening of windows except in extremely warm weather.

006.35B Static-type nonclosable exhaust roof ventilator shall be installed in low-pressure area of roof.

006.35C Auxiliary fans shall meet the following requirements:

006.35C1 Fans for the left and right sides shall be placed in a location where they can be adjusted to maximum effectiveness.

006.35C2 Fans shall be in a location where they do not obstruct vision to any mirror. Type A buses may be equipped with one fan.

006.35C3 These fans shall be a nominal six-inch diameter.

006.35C4 Fan blades shall be covered with a protective cage. Each of these fans shall be controlled by a separate switch.

#### 006.36 Wheel Housings

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006.36A Wheel house openings shall be of full-open type and shall be constructed of a minimum 16-gauge steel or equivalent strength material.

006.36B Wheel housings shall be designed to support seat and passenger loads and shall be attached to floor sheets in such manner as to prevent any dust or water from entering the body.

006.36C Inside height of wheel housings above floor line shall not exceed 12 inches.

006.36D Wheel housings shall provide clearance for dual wheels as established by National Association of Chain Manufacturers.

006.36E No part of a raised wheel housing shall extend into the emergency door opening.

006.37 Windshield and Windows

006.37A All glass in windshield, windows, and doors shall be of safety glass, so mounted that permanent mark is visible, and of sufficient quality to prevent distortion of view in any direction.

006.37B Glass in windshield shall be heat-absorbent, laminated safety glass with 0.030 inch plastic interline. Windshield shall be large enough to permit driver to see roadway clearly, shall be slanted to reduce glare, and shall be installed between front corner posts that are so designed and placed as to afford minimum obstruction to driver's view of roadway.

006.37C Unobstructed glass surface area of windshield shall comply with Federal Motor Vehicle Safety Standards in effect on date of manufacture.

006.37D Windshield shall have horizontal gradient band starting slightly above line of driver's vision and gradually decreasing in light transmission to 20 percent or less at top of windshield. (Optional for transit type buses.)

006.37E Glass in all side and rear windows shall be of AS-4 or better grade, as specified in American Standards Association Code Z26.1 1966. All glass or substitute material used in the school bus body shall also conform with current Federal Motor Vehicle Safety Standards.

006.37F Each full side window shall provide unobstructed emergency opening at least 9 inches high and 22 inches wide, obtained by lowering of window. If full drop windows are used, they shall be blocked so that when in a down position, the opening in between the window header and top of glass is not less than 9 inches.

006.37G All exposed edges of glass shall be banded. (Exempt from Type A Buses.)

006.38 Windshield Washers. The bus shall be equipped with windshield washers which shall conform to current Federal Motor Vehicle Safety Standards and body manufacturer's recommendations. The washer solvent shall be sprayed from the wiper arm. The solvent hose shall be connected in such a manner as to not become in contact with the wiper arm operation.

006.39 Windshield Wipers

006.39A Bus shall be equipped with two positive-action, two-speed or variable speed intermittent windshield wipers of air or electric type.

006.39B Two separate heavy-duty motors, with separate two-speed switches, shall be provided and equipped with blades of sufficient length to clear the windshield glass in the driver's direct view. (Exempt from Type A Buses.)

006.39C The specular gloss of the windshield wiper arms and blades shall not exceed FMVSS.

006.39D All wiper controls shall be located within easy reach of the driver and designed, when in stop position, to move blades from the driver's direct view.

006.40 Wiring

006.40A The entire electrical system of the body shall be designed for the same voltage as the chassis on which the body is mounted.

006.40B All wiring shall have an amperage capacity equal to or exceeding the designed load. All wiring splices to be done at an accessible location and noted as splices on wiring diagram.

006.40C Body power wire shall be attached to special terminal on the chassis.

006.40D All wiring shall conform to current standard of Society of Automotive Engineers J1128 - 1995.

006.40E Circuits

006.40E1 Wiring shall be arranged in circuits as required with each circuit protected by a circuit breaker. A system of color and number coding shall be used and an appropriate identifying diagram shall be provided to the end user along with the wiring diagram provided by the chassis manufacturer. The wiring diagrams shall be specific to the bus model supplied and include any changes to wiring made by

the body manufacturer. Chassis wiring diagrams shall also be supplied to the end user. A system of color and number coding shall be used on buses. The following body interconnecting circuits shall be color coded as noted:

<u>FUNCTION</u>	<u>COLOR</u>
Left Rear Directional Light	Yellow
Right Rear Directional Light	Dark Green
Stoplights	Red
Back-up Lights	Blue
Taillights	Brown
Ground	White
Ignition Feed, Primary Feed	Black

The color of cables shall correspond to SAE J 1128 (1995).

006.40E2 Wiring shall be arrange in at least six regular circuits as follows:

006.40E2a Head, tail, stop (brake) and instrument panel lamps.

006.40E2b Clearance and stepwell lamps (stepwell lamp shall be actuated when service door is open).

006.40E2c Dome lamp.

006.40E2d Ignition and emergency door signal.

006.40E2e Turn signal lamps.

006.40E2f Alternately flashing signal lamps.

006.40E3 Any of above combination circuits may be subdivided into additional independent circuits.

006.40E4 Whenever heaters and defrosters are used, at least one additional circuit shall be installed.

006.40E5 Each body circuit shall be coded by number or letter on a diagram of



circuits and shall be attached to the body in readily accessible location.

006.40F The entire electrical system of the body shall be designed for the same voltage as the chassis on which the body is mounted.

006.40G All wires within body shall be insulated and protected by covering of fibrous loom (or equivalent) which will protect them from external damage and minimize dangers from short circuits. Whenever wires pass through body member, additional protection in the form of appropriate type of insert shall be provided.

006.40H Wires not enclosed within body shall be enclosed in a protective jacket and fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equal effective connectors. The protective jackets shall be assembled to provide maximum protection against moisture and dust.

#### 007 Small Vehicle (General) Minimum Equipment Standards

##### 007.01 Construction.

007.01A The small vehicle shall be of closed integral body type.

007.01B The small vehicle shall have a wheel base of 100 inches or more.

007.01C Body shall be all steel or of a metal at least equivalent in strength to steel.

007.01D Body interior such as headliner, interior door, and side panels shall be lined with a protective material.

##### 007.02 Equipment, Vehicular. The small vehicle shall be equipped with:

007.02A Four-wheel brakes properly adjusted to efficiently stop vehicle when fully loaded.

007.02B Park brake adequate to hold vehicle when stopped on incline.

007.02C Two windshield wipers.

007.02D Rearview mirrors - one inside and one outside on left side, one outside on right.

007.02E Two tail lights.

007.02F Two stop lights.

007.02G Multiple beam halogen headlights (including indicator light).

007.02H Switch to raise or lower headlight beam.

007.02I Directional signals - front and rear (including indicator lights).

007.02J Adequate horn.

007.02K Interior adjustable sun visor.

007.02L Adequate heater and defroster.

007.02M Laminated safety glass in the windshield and tempered safety glass in other windows is permissible.

007.02N Seat belts for driver and all passengers.

007.02O Two way electronic voice communication system which can be used at any point on the vehicle's route. This may be after market provided.

007.03 Safety Equipment.

007.03A The small vehicle shall be equipped with one dry chemical type fire extinguisher with a minimum capacity of 2 ½ pounds and a rating of at least 1-A10-B:C.

007.03B The small vehicle shall be equipped with one first aid kit. (See Appendix C.)

007.03C The small vehicle shall have a removable and moisture proof body fluid clean-up kit. It shall be identified as a body fluid clean-up kit. (See Appendix D.)

007.03D The small vehicle shall carry three (3) red and orange emergency reflective triangles, in compliance with Federal Motor Vehicle Safety Standards No. 125.

007.03E Small vehicles, when used to transport handicapped children, must be equipped with support or restraining devices that meet the requirements of Federal Motor Vehicle Safety Standards in effect on date of manufacture.

008 Additional Required Equipment For Vehicles Used With Mobile Seating Devices

008.01 General Requirements. School transportation vehicles designed for transporting students with special transportation needs shall comply with *National Standards For School Transportation 1995* and with Federal Motor Vehicle Safety Standards (FMVSS) applicable to their Gross Vehicle Weight Rating (GVWR) category. In addition, any school

transportation vehicle to be used for the transportation of children who are confined to a wheelchair or other mobile positioning device, or who require life support equipment which prohibits use of the regular service entrance, shall be equipped with a power lift, unless a ramp is needed for unusual circumstances related to passenger needs.

008.02 Aisles. All school transport vehicles equipped with a power lift shall provide a 30 inch aisle leading from any wheelchair/mobility aid position to at least one emergency door and the lift area. (Exempt: small vehicles.)

008.03 Communications. All school transport vehicles which are used to transport individuals with disabilities shall be equipped with a two way electronic voice communication system which can be used at any point in the vehicles' route. This system may be after market provided

008.04 Glazing. Tinted glazing may be installed in all doors, windows, and windshields consistent with federal, state, and local regulations.

008.05 Identification. Vehicles with power lifts used for transporting individuals with disabilities shall display below the windowline the International Symbol of Accessibility. Such emblems shall be white on blue background, shall not exceed 12 inches in size, and shall be of a high-intensity reflectorized material meeting American Society for Testing and Materials, E1164.

008.06 Passenger Capacity Rating. In determining the passenger capacity of a school transportation vehicle for purposes other than actual passenger load (i.e., vehicle classification, or various billing/reimbursement models), any location in a vehicle intended for securement of an occupied wheelchair/mobility aid during vehicle operations may be regarded as four designated seating positions. Similarly, each lift area may be regarded as four designated seating positions. (Exempt: small vehicles.)

008.07 Power Lifts and Ramps. Power lift shall be located on the right side of the vehicle body when not extended. (Exempt: small vehicles.)

008.07A All vehicles covered by this specification shall provide a level-change mechanism or boarding device (e.g., lift or ramp) complying with paragraphs 8.07E through 8.07Ud of this section and sufficient clearances to permit a wheelchair or other mobility aid user to reach a securement location.

008.07B Vehicle Lift. The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

008.07C Lift Capacity. The lifting mechanism and platform shall be able to lift a minimum of 800 pounds.

008.07D Controls shall be provided that will enable the operator to activate the lift mechanism from either inside or outside of the bus. Exception: The controls may be interlocked with the vehicle brakes, transmission, or door, or shall provide other appropriate mechanisms or systems, to ensure that the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels (i.e., ground, curb, and intermediate positions) normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position. Where the lift is designed to deploy with its long dimension parallel to the vehicle axis and which pivots into or out of the vehicle while occupied (i.e., "rotary lift"), the requirements of this paragraph prohibiting the lift from being stowed while occupied shall not apply if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

008.07E Emergency Operation. The lift shall incorporate an emergency method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied. No manual emergency operation shall require more than two minutes to lower an occupied wheelchair to ground level.

008.07F Power or Equipment Failure. Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

008.07G Platform Barriers. The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the platform during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the platform is in its fully raised position. Each side of the lift platform which extends beyond the vehicle in its raised position shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier (outer barrier), which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to

prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically raise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the platform is more than 3 inches above the roadway or sidewalk and the platform is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged, or disengaged by the lift operator, provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

008.07H Platform Surface. The platform surface shall be free of any protrusions over  $\frac{1}{4}$  inch high and shall be slip resistant. The platform shall have a minimum clear width of 28 $\frac{1}{2}$  inches at the platform, minimum clear width of 30 inches measured from 2 inches above the platform surface to 30 inches above the surface of the platform, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface of the platform.

008.07I Platform Gaps. Any openings between the platform surface and the raised barriers shall not exceed  $\frac{5}{8}$  inch in width. When the platform is at vehicle floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and the vehicle floor shall not exceed  $\frac{1}{2}$  inch horizontally and  $\frac{5}{8}$  inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1  $\frac{1}{2}$  inches by 4  $\frac{1}{2}$  inches located between the edge barriers.

008.07J Platform Entrance Ramp. The outboard entrance ramp or loading-edge barrier used as a ramp and the transition plate from the inboard edge of the platform to the vehicle floor shall not exceed a slope of 1:8, measured on level ground, for a maximum rise of 3 inches, and the transition from roadway or sidewalk to ramp may be vertical without edge treatment up to  $\frac{1}{4}$  inch. Thresholds between 1.4 inch and  $\frac{1}{2}$  inch high shall be beveled with a slope no greater than 1:2.

008.07K Platform Deflection. The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees exclusive of vehicle roll or pitch) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the platform.

008.07L Platform Movement. No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3 g.

008.07M Boarding Direction. The lift shall permit both inboard and outboard facing of wheelchair and mobility aid users.

008.07N Use by Standees. Lifts shall accommodate persons using walkers, crutches, cane or braces, or who otherwise have difficulty using steps. The platform may be marked to indicate a preferred standing position.

008.07O Handrails. Platforms on lifts shall be equipped with handrails on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent-grasping surface, and have eased edges with corner radii of not less than ⅜ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

008.07P Circuit Breaker. A re-setable circuit breaker shall be installed between power source and lift motor if electrical power is used. It shall be located as close to the power source as possible, but not within the passenger/driver compartment.

008.07Q Excessive Pressure. Lift design shall prevent excessive pressure that could damage the lift system when the platform is fully lowered or raised, or that could jack the vehicle.

008.07R Documentation. The following information shall be provided with each vehicle equipped with a lift.

008.07Ra A phone number where information can be obtained about installation, repair, and parts. (Detailed written instructions and a parts list shall be available upon request.)

008.07Rb Detailed instructions regarding use of the lift and readily visible when the lift door is open, including a diagram showing the proper placement and positioning of wheelchair/mobility aids on lift.

008.07S Training Materials. The lift manufacturer shall make available training materials to ensure the proper use and maintenance of the lift. These may include instructional videos, classroom curriculum, system test results, or other related materials.

008.07T Identification and Certification. Each lift shall be permanently and legibly marked or incorporate a non-removable label or tag which states that it conforms to all applicable requirements of the current National Standards for School Transportation

(1995). In addition, the lift manufacturer, or an authorized representative, upon request of the original titled purchaser, shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the lift system meets all the applicable requirements of the current National Standards for School Transportation (1995).

008.07U Vehicle Ramp.

008.07Ua If a ramp is used, it shall be of sufficient strength and rigidity to support the special device, occupant, and attendant(s). It shall be equipped with a protective flange on each longitudinal side to keep special device on the ramp.

008.07Ub Floor of ramp shall be of non-skid material.

008.07Uc Ramp shall be equipped with handles and be of weight and design to permit one person to put ramp in place and return it to its storage place.

008.07Ud Ramps installed in raised floor buses by manufacturers may be used for emergency evacuation purposes. They shall not be used as a substitute for a lift when a lift is capable of servicing the need.

008.08 Regular Service Entrance. 008.08A On power-lift equipped vehicles, step shall be the full width of the stepwell, excluding the thickness of doors in open position.

008.08B A suitable device shall be provided to assist passengers during entry or egress. This device shall allow for easy grasping or holding and shall have no openings or pinch points which might entangle clothing, accessories or limbs.

008.09 Restraining Devices

008.09A On power-lift equipped vehicles, seat frames may be equipped with attachments or devices to which belts, restraining harnesses or other devices may be attached. Attachment framework or anchorage devices, if installed, shall conform with FMVSS in effect on date of manufacture.

008.09B Seat belt assemblies, if installed, shall conform to FMVSS in effect on date of manufacture.

008.09C Child restraint systems, which are used to facilitate the transportation of children who in other modes of transportation would be required to use a child, infant, or booster seat, shall conform to FMVSS in effect on date of manufacture.

008.10 Seating Arrangements. Flexibility in seat spacing to accommodate special devices shall be permitted to meet passenger requirements. All seating shall be forward facing.

008.11 Securement and Restraint System for Wheelchair/Mobility Aid and Occupant.

For purposes of better understanding the various aspects and components of this section, the term securement of phrase securement system used exclusively in reference to the device(s) which secure the wheelchair/mobility aid. The term restraint or phrase restraint system is used exclusively in reference to the device(s) used to restrain the occupant of the wheelchair/mobility aid. The phrase securement and restraint system is used to refer to the total system which secures and restrains both the wheelchair/mobility aid and the occupant.

008.11A Securement and Restraint System--General.

008.11A1 The Wheelchair/Mobility Aid Securement and Occupant Restraint System shall be designed, installed, and operated to accommodate passengers in a forward-facing orientation within the vehicle and shall comply with all applicable requirements of FMVSS in effect on date of manufacture. In addition, gurney type devices shall be secured on the inside of the vehicle parallel to the side of each vehicle.

008.11A2 The securement and restraint system, including the system track, floor plates, pockets, or other anchorages shall be provided by the same manufacturer, or be certified to be compatible by manufacturers of all equipment/systems used.

008.11A3 When a wheelchair/mobility aid securement device and an occupant restraint share a common anchorage, including occupant restraint designs that attach the occupant restraint to the securement device or the wheelchair/mobility aid, the anchorage shall be capable of withstanding the loads of both the securement device and occupant restraint applied simultaneously.

008.11A4 When a wheelchair/mobility aid securement device (webbing or strap assembly) is shared with an occupant restraint, the wheelchair/mobility aid securement device (webbing or strap assembly) shall be capable of withstanding a force twice the amount.

008.11A5 The vehicle body floor and sidewall structures where the securement and restraint system anchorages are attached shall have equal or greater strength than the load requirements of the system(s) being installed.

008.11A6 The occupant restraint system shall be designed to be attached to the vehicle body either directly or in combination with the wheelchair/mobility aid securement system, by a method which prohibits the transfer of weight or force from the wheelchair/mobility aid to the occupant in the event of an impact.

008.11A7 When an occupied wheelchair/mobility aid is secured in accordance with the manufacturer's instructions, the securement and restraint system shall limit the



movement of the occupied wheelchair/mobility aid to no more than 2 inches in any direction under normal driving conditions.

008.11A8 The securement and restraint system shall incorporate an identification scheme which will allow for the easy identification of the various components and their functions. It shall consist of one of the following, or combination thereof:

008.11A8a The wheelchair/mobility aid securement (webbing or strap assemblies) and the occupant restraint belt assemblies shall be of contrasting color or color shade.

008.11A8b The wheelchair/mobility aid securement device (webbing or strap assemblies) and occupant restraint belt assemblies shall be clearly marked to indicate the proper wheelchair orientation in the vehicle, and the name and location for each device or belt assembly, i.e., front, rear, lap belt, shoulder belt, etc..

008.11A9 All attachment or coupling devices designed to be connected or disconnected frequently shall be accessible and operable without the use of tools or other mechanical assistance.

008.11A10 All securement and restraint system hardware and components shall be free of sharp or jagged areas and shall be of a non-corrosive material or treated to resist corrosion.

008.11A11 The securement and restraint system shall be located and installed such that when an occupied wheelchair/mobility aid is secured, it does not block access to the lift door.

008.11A12 A device for storage of the securement and restraint system shall be provided. When the system is not in use, the storage device shall allow for clean storage of the system, shall keep the system securely contained within the passenger compartment, shall provide reasonable protection from vandalism, and shall enable the system to be readily accessed for use.

008.11A13 The entire securement and restraint system, including the storage device, shall meet the flammability standards established in FMVSS in effect on date of manufacture.

008.11A14 Each securement device (webbing or strap assembly) and restraint belt assembly shall be permanently and legibly marked or incorporate a non-removable label or tag which states that it conforms to all applicable FMVSS in effect on date of manufacture, as well as the current National Standards for School Transportation

(1995). In addition, the system manufacturer, or an authorized representative, upon request by the original titled purchaser, shall provide a notarized Certificate of Conformance, either original or photocopied, which states that the wheelchair/mobility aid securement and occupant restraint system meets all of the requirements as specified in FMVSS in effect on date of manufacture and the current National Standards for School Transportation (1995).

008.11A15 The following information shall be provided with each vehicle equipped with a securement and restraint system:

008.11A15a A phone number where information can be obtained about installation, repair, and parts. Detailed written instructions and a parts list shall be available upon request.

008.11A15b Detailed instructions regarding use, including a diagram showing the proper placement of the wheelchair/mobility aids and positioning of securement devices and occupant restraints, including correct belt angles.

008.11A16 The system manufacturer shall make available training materials to ensure the proper use and maintenance of the wheelchair/mobility aid securement and occupant restraint system. These may include instructional videos, classroom curriculum, system test results, or other related materials.

008.11B Wheelchair/Mobility Aid Securement System

008.11B1 Each securement system location shall consist of a minimum of four anchorage points. A minimum of two anchorage points shall be located in front of the wheelchair/mobility aid and a minimum of two anchorage points shall be located in the rear. The securement anchorages shall be attached to the floor of the vehicle and shall not interfere with passenger movement or present any hazardous condition.

008.11B2 Each securement system location shall have a minimum clear floor area of 30 inches by 48 inches. Additional floor area may be required for some applications. Consultation between the user and the manufacturer is recommended to ensure adequate area is provided.

008.11B3 The securement system shall secure common wheelchair/mobility aids and shall be able to be attached easily by a person having average dexterity and who is familiar with the system and wheelchair/mobility aid.

008.11B4 As installed, each securement anchorage shall be capable of withstanding a minimum force of 3,000 pounds (13,344 Newtons) when applied as specified in FMVSS in effect on date of manufacture. In addition, when more than

one securement device share a common anchorage, the anchorage shall be capable of withstanding the force indicated above, multiplied by the number of securement devices sharing that anchorage.

008.11B5 Each securement device, if incorporating webbing or a strap assembly, shall comply with the requirements for type 1 safety belt systems, in accordance with FMVSS in effect on date of manufacture.

008.11B6 The securement system shall secure the wheelchair/mobility aid in such a manner that the attachments or coupling hardware will not become detached when any wheelchair/mobility aid component deforms, when one or more tires deflate, and without intentional operation of a release mechanism (e.g., a spring clip on a securement hook).

008.11B7 Each securement device (webbing or strap assembly) shall be capable of withstanding a minimum force of 2,500 pounds when tested in accordance with FMVSS in effect on date of manufacture.

008.11B8 Each securement device (webbing or strap assembly) shall provide a means of adjustment, of manufacturer's design, to remove slack from the device or assembly.

#### 008.11C Occupant Restraint System

008.11C1 A Type 2 occupant restraint system shall provide for restraint of the occupant.

008.11C2 The occupant restraint system shall be made of materials which do not stain, soil, or tear an occupant's clothing, and which are resistant to water damage and fraying.

008.11C3 Each restraint system location shall have not less than one anchorage, of manufacturer's design, for the upper end of the upper torso restraint.

008.11C3a The anchorage for each occupant's upper torso restraint shall be capable of withstanding a minimum force of 1,500 pounds (6,672 Newtons) when applied.

008.11C4 Each wheelchair/mobility aid location shall have not less than two floor anchorages for the occupant pelvic and the connected upper torso restraint.

008.11C4a Each floor anchorage shall be capable of withstanding a minimum force of 3,000 pounds (13,344 Newtons) when applied.

008.11C4b When more than one occupant restraint share a common anchorage, the anchorage shall be capable of withstanding a minimum force of 3,000 pounds (13,344 Newtons) multiplied by the number of occupant restraints sharing the common anchorage.

008.11C5 Each floor and wall anchorage which secures the occupant restraint to the vehicle and which is not permanently attached, shall be of a "positive latch" design, and shall not allow for any accidental disconnection.

008.12 Special Light. Doorways in which lifts are installed, shall have, when lift is to be used, at least 2 foot-candles of illumination measured on the floor of the vehicle immediately adjacent to the lift, and on the lift, when deployed at the vehicle floor level.

008.13 Special Service Entrance

008.13A Power lift equipped bodies shall have a special service entrance to accommodate the power lift.

Exception: If the lift is designed to operate within the regular service entrance, and is capable of stowing such that the regular service entrance is not blocked in any way, and that persons entering or exiting the vehicle are not impeded in any way, a special service entrance shall not be required.

008.13B The special service entrance and door shall be located on the right side of the vehicle and shall be designed so as not to obstruct the regular service entrance. (Exempt: small vehicles.)

Exception: A special service entrance and door may be located on the left side of the vehicle only if the vehicle is primarily used to deliver students to the left side of one way streets and its use is limited to that function.

008.13C The opening may extend below the door through the bottom of the body skirt. If such an opening is used, reinforcements shall be installed at the front and rear of the floor opening to support the floor and give the same strength as other floor openings.

008.13D A drip molding shall be installed above the opening to effectively direct water from entrance.

008.13E Door posts and headers from entrance shall be reinforced sufficiently to provide support and strength equivalent to the areas of the side of the bus not used for special service entrance.

008.14 Special Service Entrance Doors

008.14A A single door or double doors may be used for the special service entrance.

008.14B A single door shall be hinged to the forward side of the entrance unless doing so would obstruct the regular service entrance. If, due to the above condition, the door is hinged to the rearward side of the doorway, the door shall utilize a safety mechanism which will prevent the door from swinging open should the primary door latch fail. If double doors are used, the system shall be designed to prevent the door(s) from being blown open by the wind resistance created by the forward motion of the bus, and/or incorporate a safety mechanism to provide secondary protection should the primary latching mechanism(s) fail.

008.14C All doors shall have positive fastening devices to hold doors in the open position.

008.14D All doors shall be weather sealed.

008.14E When manually-operated dual doors are provided, the rear door shall have at least a one-point fastening device to the header. The forward-mounted door shall have at least three-point fastening devices. One shall be to the header, one to the floor line of the body, and the other shall be into the rear door. The door and hinge mechanism shall be of a strength that is greater than or equivalent to the emergency exit door.

008.14F Door materials, panels and structural strength shall be equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering and other exterior features shall match adjacent sections of the body.

008.14G Each door shall have windows set in rubber which are visually similar in size and location to adjacent non-door windows. Glazing shall be of same type and tinting (if applicable) as standard fixed glass in other body locations.

008.14H Door(s) shall be equipped with a device that will actuate an audible or flashing signal located in the driver's compartment when door(s) is/are not securely closed and ignition is in "on" position.

008.14I A switch shall be installed so that the lifting mechanism will not operate when the lift platform door(s) is/are closed.

008.14J Special service entrance doors shall be equipped with padding at the top edge of the door opening. Pad shall be at least three inches wide and one inch thick and extend the full width of the door opening.

#### 008.15 Support Equipment and Accessories

008.15A Each vehicle which is set up to accommodate wheelchair/mobility aids or

other assistive or restraint devices which utilize belts, shall contain at least one belt cutter properly secured in a location within reach of the driver while belted into his/her driver's seat. The belt cutter shall be designed to eliminate the possibility of the operator or others being cut during use.

008.15B Special equipment or supplies which are used on the bus mobility assistance, health support, or safety purposes shall meet any local, federal, or engineering standards which may apply, including proper identification. Equipment which may be used for these purposes includes, but is not limited to:

008.15B1 Wheelchairs and other Mobile Seating Devices.

008.15B2 Crutches, walkers, canes, and other ambulating devices.

008.15B3 Medical Support Equipment. This may include respiratory devices such as oxygen bottles (which should be no larger than 22 cubic feet for liquid oxygen and 38 cubic feet for compressed gas), or ventilators. Tanks and valves should be located and positioned to protect them from direct sunlight, bus heater vents, or other heat sources. Other equipment may include intravenous, and fluid drainage apparatus.

008.15C All portable equipment and special accessory items shall be secured at the mounting location to withstand a pulling force of five times the weight of the item, or shall be retained in an enclosed, latched compartment. The compartment shall be capable of withstanding forces applied to its interior equal to five times the weight of its contents without failure to the box's integrity and securement to the bus. Exception: If these standards provide specific requirements for securement of a particular type of equipment, the specific standard shall prevail (i.e., wheelchairs).

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CHAPTER 93  
APPENDIX A - National School Bus Yellow

The color known as National School Bus Yellow was designated as such by the 1939 National Conference on School Bus Standards. The National Bureau of Standards of the U.S. Department of Commerce assisted in developing this color and its colormetric specifications.

At the 1980 conference, the colors in use were reviewed. A color standard was selected, slightly different from above, and specific tolerances were chosen. These tolerances will ensure a continuity of appearance from bus to bus, and within the same bus when different elements are finished or refinished at different times.

When it was determined that the use of lead and chromium in paint was a health hazard, the national Bureau of Standards of the U.S. Department of Commerce assisted the S.B.M.I. in developing their color standard No. SBMI-008, which further defined the tolerances to permit better definition of the color. Specifications for the standard color, with light and dark tolerances are shown below in tabular form.

COLORMETRIC (CIE) DATA

DESCRIPTION	REFLECTANCE	CHROMATICITY	
	<u>Y</u>	<u>X</u>	<u>Y</u>
Centroid	41.5%	.5139	.4434
V+ Light Limit	42.9%	.5139	.4427
V- Dark Limit	39.8%	.5133	.4422
H+ Green Limit	41.6%	.5123	.4368
H- Red Limit	41.7%	.5168	.4489
C+ Vivid Limit	41.5%	.5188	.4457
C- Weak Limit	41.5%	.5095	.4405

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 APPENDIX B - Estimating Alternator and Battery Capacity

TABLE A

If electrical load is increased through addition of heater motor, electrical windshield wipers, defroster, etc., use the following table for guidance in selecting alternator and battery of adequate capacity:

CONSTANT LOAD

Equipment	Number of Units	Current Draw (Amperes)
Ignition (Average) .....	.....	2.50
Headlamps (Type 2 dual lower beam) .....	2 .....	8.40
Taillights .....	2 .....	1.18
Clearance lights .....	4 .....	2.36
Cluster lights .....	6 .....	3.54
Body instrument panel .....	.....	0.80
Primary front heater motors .....	2 .....	24.00
Primary defroster motor .....	1 .....	12.00
Supplementary front heater motor .....	1 .....	12.00
Supplementary defroster .....	1 .....	12.00
Underseat heater motors .....	2 .....	10.50
Underseat heater motor .....	1 .....	8.50
Defroster fan motor .....	1 .....	3.50
Windshield wipers .....	.....	14.00
Fuel pump .....	.....	3.00

INTERMITTENT LOAD

Flasher motor .....	.....	2.90
Alternately flashing signal lamps .....	2 .....	11.60
Step-well and 6 interior dome lights .....	.....	5.64
Individual additional dome lights .....	.....	0.94
Stop (brake) lights .....	4 .....	6.60
Turn signals .....	2 .....	2.36
Emergency door buzzer .....	.....	1.00

To determine the electrical load (in amperes) for a typical school bus, the following formula is recommended:

$$\text{Constant load} + 35\% \text{ of Intermittent load} = \text{Total load}$$



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APPENDIX C - First Aid Kit

<u>ITEM</u>	<u>UNITS</u>
Sterile gauze compress (36 in. x 36 in) .....	3
Non-sterile triangular bandage (40 in x 36 in x 54 in) .....	2
Sterile gauze pad (3 in. x 3 in.) .....	24
Adhesive tape (1 in. x 2 ½ yd.) .....	2
Gauze roller bandage (2 in. x 6 ft.) .....	2
Bandage compress (3 in.) .....	12
Bandage compress (2 in.) .....	12
Bandage scissors (4 in.) .....	1
Sterile eye pads .....	3
Adhesive bandage (¾ in. x 3 in.) .....	100
Moisture and dustproof kit of sufficient capacity to contain materials of the first aid kit .....	1
Pair latex gloves .....	1
Mouth to mouth airway .....	1

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 CHAPTER 93  
 APPENDIX D - Body Fluid Clean-up Kit

<u>ITEM</u>	<u>UNITS</u>
Absorbent Pack - 5 oz .....	1
Plastic disposable gloves (2) .....	1 pr.
Scoop .....	1
Scraper .....	1
Plastic trash bag with tie (Minimum 12 in. x 12 in.) 1 Red-biohazard and 1 Black .....	2
Disinfectant - 8 oz. ....	1
Disposable Environmental Protection Agency (EPA) registered germicidal towels .....	1
Benzalkonium Chloride towelette .....	1
Antiseptic biohand cleaner - 4 oz. ....	1
Moisture and dustproof kit of sufficient capacity to contain materials of the body fluid clean-up kit .....	1

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CHAPTER 93  
APPENDIX E - SCHOOL BUS SEAT UPHOLSTERY FIRE BLOCK TEST

A. TEST CHAMBER

Cross Section

The suggested test chamber is same cross section as bus body in which seats are used with rear section on each end. If bus section is not used, cross section to be  $91" \pm 1"$  in width x  $75" \pm 3"$  in height. There shall be a door, which does not provide ventilation, in the center of each end of the test chamber. The doors shall be  $38" \pm 3"$  in width and  $53" \pm 3"$  in height and include a latch to keep the doors closed during the test. See Figure 1.

Length

Length of chamber shall allow 3 rows of seats at the minimum spacing recommended by the installer or required by Federal Motor Vehicle Safety Standards. See figure 1, Detail A.

In order that different types of seats may be tested in the same chamber, a length tolerance of plus 45" is allowed.

Ventilation

One ventilation opening shall be in each end of the test chamber and shall be 325 square inches  $\pm 25$  square inches. The bottom of the opening shall be  $30" \pm 3"$  above the chamber floor. Ventilation openings shall be on the same side of the test chamber. See Figure 1.

There shall be no ventilation openings along the length of the test chamber.

A forced air ventilation system may not be used.

Baffles shall be used to prevent wind from blowing directly into the ventilation openings.

Camera View Area

An opening covered with glass shall be provided at the midpoint of the chamber length for camera viewing. The opening shall allow the camera to view the seat parallel to the seat width. See Figure 1.

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APPENDIX E - SCHOOL BUS SEAT UPHOLSTERY FIRE BLOCK TEST

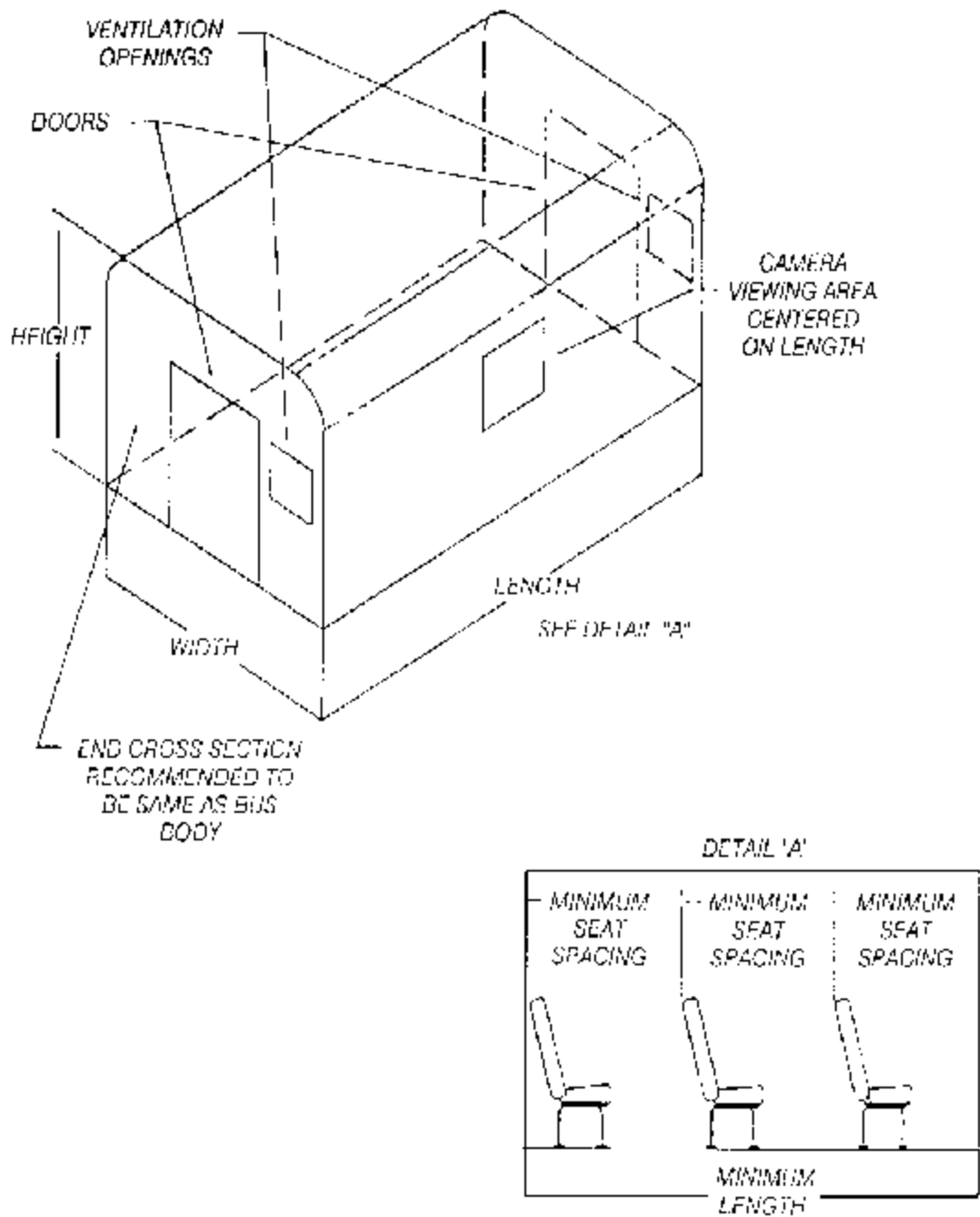


FIGURE 1

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APPENDIX E - SCHOOL BUS SEAT UPHOLSTERY FIRE BLOCK TEST

B. TEST SAMPLE

Sample shall be fully-assembled seat.

Record the weight of all padding and upholstery prior to assembly. Record the weight of the fully-assembled seat.

C. IGNITION

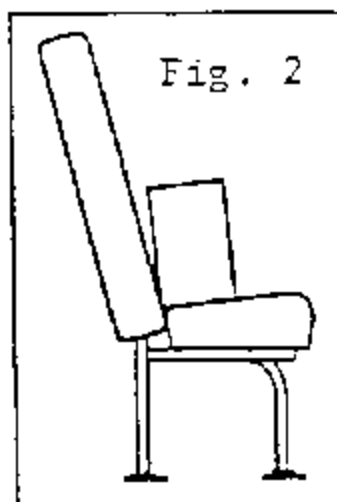
A paper grocery bag whose dimensions are approximately 7" x 11" x 18" is used to contain double sheets of newsprint (black print only, approximately 22" x 28"). The total combined weight of bag and newspaper shall be 7 oz.  $\pm$  .5 oz.

D. TEST PROCEDURE

1. Install 3 seats in test chamber at minimum spacing per installer recommendation or FMVSS requirement. Seats shall be perpendicular to the dimension indicated as "length" in Figure 1. Install so that seat frames will not fall during test. Seat width shall be determined so that maximum passenger capacity per row (2 seats) for the seat style shall be tested.
2. For each test, position ignition source in the following positions outlined. Widest seat in the center row shall be tested.

Position A.

Position ignition source with 18" dimension in contact with seat cushion and touching seat back. Center bag on top of cushion.  
See Figure 2.

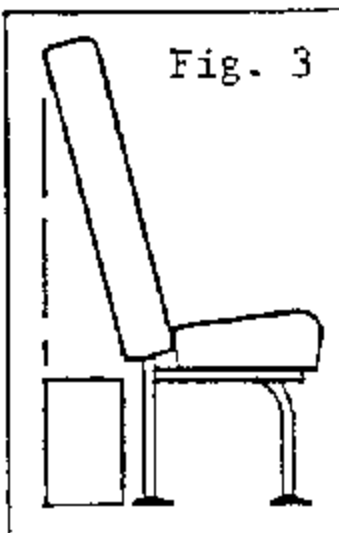


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APPENDIX E - SCHOOL BUS SEAT UPHOLSTERY FIRE BLOCK TEST

Position B.

Position ignition source on floor behind seat with 18" dimension on floor and parallel to seat width centered on width so that rear of bag does not extend rear of seat back.

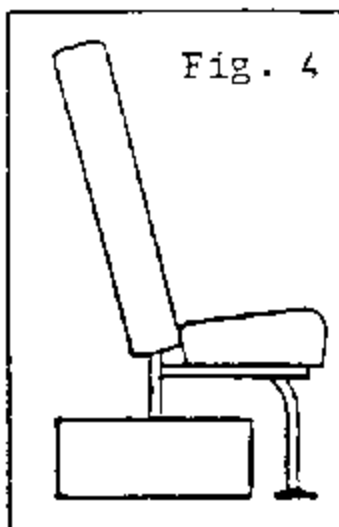
See Figure 3.



Position C.

Position ignition source on floor on aisle side of seat with 18" dimension on floor and perpendicular to seat width touching seat leg with centerline of bag at center of seat back.

See Figure 4.



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APPENDIX E - SCHOOL BUS SEAT UPHOLSTERY FIRE BLOCK TEST

3. A wooden match shall be used to light the ignition source. Time the test beginning where the ignition source is on fire until all flame is out.
4. After each ignition source position test, weigh seat assembly including loose materials on the seat. Do not include loose material which has fallen off the seat onto the floor.

E. PERFORMANCE CRITERIA

For each ignition source position test, the seat tested must meet all of the following criteria. A new seat specimen may be used for each ignition source position test.

1. Maximum time from ignition to flameout shall be 8 minutes.
2. Flame shall not spread to any other seat with ignition source in position A and Position C.
3. Weight loss may not exceed 10% of pretest weight of padding and upholstery.

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APPENDIX F - NOISE TEST PROCEDURE

- A. The vehicle is located so that no other vehicle or signboard, building, hill, or other large reflecting surface is within 15.2 m (50 feet) of the occupant's seating position.
- B. All vehicle doors, windows, and ventilators are closed.
- C. All power-operated accessories are turned off.
- D. The driver is in the normal seated driving position and the person conducting the test is the only other person in the vehicle.
- E. A sound level meter is used that is set at the "A-weighting fast" meter response and meets the requirements of:
  - 1. The American National Standards Institute, Standard ANSI S1.4-1971. "Specifications for Sound Level Meters," for Type 1 Meters: or
  - 2. The International Electrotechnical Commission (IEC), Publication No. 179 (1973). "Precision Sound Level Meters".
- F. The microphone is located so that it points vertically upward 6 inches to the right and directly in line with and on the same plane as the occupant's ear adjacent to the primary noise source.
- G. If the motor vehicle's engine radiator fan drive is equipped with a clutch or similar device that automatically either reduces the rotational speed of the fan or completely disengages the fan from its power source in response to reduced engine cooling loads, the vehicle may be parked before testing with its engine running at high idle or any other speed the operator chooses for sufficient time, but not more than 10 minutes, to permit the engine radiator fan to automatically disengage.
- H. With the vehicle's transmission in neutral gear, the engine is accelerated to:
  - 1. its maximum governed speed, if it is equipped with an engine governor, or
  - 2. its speed at its maximum rated horsepower, if it is not equipped with an engine governor, and the engine is stabilized at that speed.
- I. The A-weighted sound level reading on the sound level meter for the stabilized engine speed condition referred to in H.1. or H.2. above is observed and, if it has not been influenced by extraneous noise sources, is recorded.



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APPENDIX F - NOISE TEST PROCEDURE

- J. The vehicle's engine speed is returned to idle and the procedures set out in paragraphs H. and I. are repeated until two maximum sound levels within 2 dbA of each other are recorded, the two maximum sound level readings are then averaged; and
- K. The average obtained in accordance with paragraph J., with a value of 2 dbA subtracted there from to allow for variations in the test conditions and in the capabilities of meters, is the vehicle's interior sound level at the driver's seating position for the purposes of determining compliance with the requirements of this test procedure.

Subtracted there from to allow for variations in the test conditions and in the capabilities of meters, is the vehicle's interior sound level at the driver's seating position for the purposes of determining compliance with the requirements of this test procedure.

Sufficient to withstand a force of five (5) times the maximum rated capacity of the compartment.

RETRO REFLECTIVE SHEETING  
 DAYTIME COLOR SPECIFICATION PROPOSAL

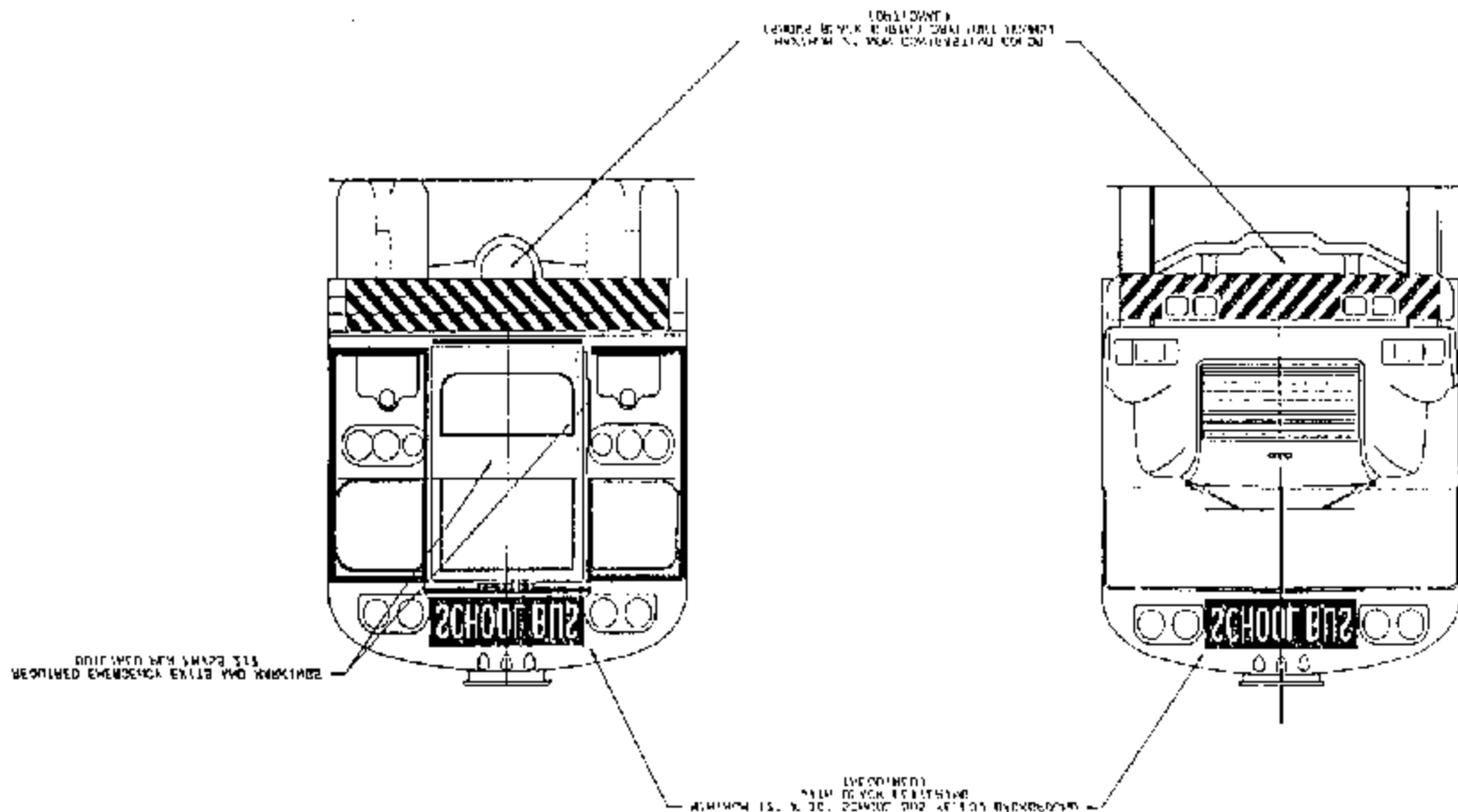
The daytime color of the RETRO REFLECTIVE sheeting used to enhance school bus safety requires different color tolerances in order to assure optimum safety benefit as well as to be consistent with the color of the school bus.

The color of the RETRO REFLECTIVE sheeting shall conform to the table below when samples applied to aluminum test panels are measured as specified in ASTM E1164. For colorimetric measurements, material is illuminated by Standard Illuminant D65 at an angle of 45 degrees with the normal to the surface the observations are made in the direction of the normal (45/0 degree geometry). The inverse (0/45 degree geometry) with the illuminant at the normal to the surface and the observations at 45 degrees with the normal to the surface may also be used. For materials which are directionally sensitive (e.g. prismatic sheeting), the colorimetric measurements are made using circumferential illumination and viewing and the various measurements are averaged. Calculations shall be done in accordance with ASTM E308 using the CIE 1931 (2 degree) Standard Observer.

RETRO REFLECTIVE SHEETING DAYTIME COLOR  
 CHROMATICITY COORDINATES OF CORNER POINTS  
 DETERMINING THE PERMITTED COLOR AREA

Yellow	X	0.484	0.513	0.517	0.544
	Y	0.455	0.426	0.482	0.455
Luminance Factor (Y%)		Minimum	10.0		
		Maximum	36.0		

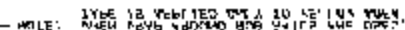
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APPENDIX G - RETRO REFLECTIVE SHEETING



TITLE 92

## CHAPTER 93

## APPENDIX G - RETRO REFLECTIVE SHEETING



RECEIVED DIRECTOR, FBI WASH. METRO OFFICE

TITLE 92  
CHAPTER 93  
APPENDIX H - REFERENCE LIST

Sections:

American National Standards Institute 1430 Broadway New York, NY 10018	005.18B
American Society for Testing & Materials 1916 Race Street Philadelphia, PA 19103	008.05
School Bus Manufacturers Institute Division of Truck Body & Equipment Association 4907 Cordell Avenue Bethesda, MD 20814 (301) 652-8004	005.13F, 005.14D, 005.14F, 005.17, and 006.14F
Society of Automotive Engineers (SAE) 400 Commonwealth Drive Warrendale, PA 15096 (412) 776-4841	005.10I, 005.20A, 005.20D, 006.02, 006.18D1, 006.30A, 006.40D, 006.45E, 006.14E7 006.14G, 006.18G, and 006.41E1
Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062 (312) 272-8800	006.14K and 006.24C
U.S. Government Printing Office Superintendent of Documents Washington, D.C. 20402	001.02, 001.04, 005.03G, 006.04B, 006.07D2, 006.11B9, 006.11B7, 006.14E7, 006.20B, 006.26N, 006.27, 006.38C 006.38E, and 007.03D
National Standards for School Transportation Missouri Safety Center Central Missouri State University Humphrey's Suite 201 Warrensburg, MO 64093	008.11A14

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APPENDIX H - REFERENCE LIST

Sections:

National Fire Protection Agency 1 Batterymark Park P.O. Box 9101 Quincy, MA 02269	005.14H and 005.15B
Federal Motor Carrier Safety Regulations American Trucking Assoc., Inc. 2200 Mill Rd. Alexandria, VA 22314	006.14K
Documont Engineering Co. Federal Specification TT-C520B Van Nuys, CA 91405	006.35A and 006.35B
U.S. Department of Commerce Office of Product Standards Policy National Bureau of Standards Washington, D.C. 20231	006.09E
Department of Transportation Federal Highway Administration 400 Seventh St. S.W. Washington, D.C. 20590	006.15A

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CHAPTER 93  
APPENDIX I - FEDERAL MOTOR VEHICLE SAFETY STANDARDS  
AND REGULATIONS, 49 CFR 571.101 Et Seq.

- 101 Control location, identification, and illumination.
- 102 Transmission shift lever sequence, starter interlock, and transmission braking effect.
- 103 Windshield defrosting and defogging systems.
- 104 Windshield wiping and washing systems.
- 105 Hydraulic braking systems.
- 106 Brake Hoses.
- 107 Reflecting surfaces.
- 108 Lamps, reflective devices, and associated equipment.
- 109 New pneumatic tires.
- 110 Tire selection and rims.
- 111 Rearview mirrors.
- 113-2 Hood latch systems.
- 116 Motor vehicle brake fluids.
- 119 New pneumatic tires for vehicles other than passenger cars.
- 120 Tire selection and rims for motor vehicles other than passenger cars.
- 121 Air brake systems.
- 124 Accelerator control systems.
- 205 Glazing materials
- 206 Door locks and door retention components.
- 207 Seating systems.
- 208 Occupant crash protection.
- 209 Seat belt assemblies.
- 210 Seat Belt assembly anchorages.
- 217 Bus window retention and release.
- 219 Windshield zone intrusion for vehicles with a GVWR of 10,000 pounds or less.
- 220 School bus rollover protection.
- 221 School bus body joint strength.
- 222 School bus passenger seating and crash protection.
- 301 Fuel system integrity.
- 302 Flammability of interior materials.

As found in "Federal Motor Vehicle Safety Standards and Regulations; With Amendments and Interpretations," U.S. Department of Transportation, National Highway Traffic Safety Administration, Washington, D.C. 20590, U.S. Government Printing Office.